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ABSTRACT

This document reviews the findings of relatively small, controlled, long-term evaluations of preschool programs in various parts of the country. It is an attempt to clarify unresolved issues arising from the Westinghouse Learning Corporation Report on the impact of Project Head Start. Generally, this review focuses on the following question: What is known about the impact of any type of preschool intervention program? The report includes chapters on (1) Head Start graduates in school (studies from New Haven, Connecticut), (2) impact of early education on disadvantaged children (based on a Philadelphia study), (3) a five-year enrichment curriculum ranging from preschool to third grade levels (New York City, IDS Program), (4) the Early Training Project, (5) effects of economic deprivation on nursery school performance (study at Howard University), (6) The Karnes' Preschool Program (University of Illinois, Urbana-Champaign), (7) The Learning to Learn Program, and (8) The Ypsilanti Perry Preschool Project. It is concluded that early intervention does have an immediate impact (within one year) on the child's performance when measured by the Stanford-Binet, or personal-social adjustment ratings. On a long term basis, positive impact of intervention programs on school performance has been reported. Variables such as age, sex, and socio-economic status may affect the quality of intervention impact. (DP)

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A
REPORT
ON
LONGITUDINAL
EVALUATIONS
OF
PRESCHOOL
PROGRAMS

Volume I
Longitudinal Evaluations

PS 007392

A REPORT ON LONGITUDINAL EVALUATIONS OF PRESCHOOL PROGRAMS

VOLUME I: LONGITUDINAL EVALUATIONS

SALLY RYAN, Ph.D. (Ed.)

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TABLE OF CONTENTS

Page

Introduction v

Contributors vii

Chapter 1. Head Start Graduates in School: Studies in New Haven, Connecticut
Willa D. Abelson 1

Chapter 2. Impact of Early Education on Disadvantaged Children
E. Kuno Beller 15

Chapter 3. A Brief Synopsis of an Initial Enrichment Program in Early Childhood
Martin Deutsch, Elizabeth Taleporos, and Jack Victor 49

Chapter 4. Children From Three to Ten: The Early Training Project
Susan W. Gray 61

Chapter 5. Double Deprivation: The Less They Have, The Less They Learn
Elizabeth Herzog, Carol H. Newcomb, Ira H. Cisin 69

Chapter 6. The Karnes' Preschool Program: Rationale, Curricula Offerings, and Follow-up Data
Merle B. Karnes, R. Reid Zehrbach, and James A. Teska 95

Chapter 7. Learning to Learn Program
Herbert Sprigle 109

Chapter 8. Results of A Preschool Intervention Project
David P. Weikart, Dennis J. Deloria, and Sarah Lawser 125

Overview . Sally Ryan 135

INTRODUCTION

With the launching of Project Head Start in 1965 came the first major federal effort to provide funds for early childhood intervention programs concerned with the total development of the child. As with any large federal program, implementation of the Head Start idea was a tremendous task and reflected the variety of regional problems and interests in this country. Similarly evaluation of this program has been limited by the varied degrees of program development, population needs, available staff, and funding demands in the various regions. Evaluation data when it was obtained and released was used more to provide descriptive information about the population of children and the types of centers, than to predict how well the centers enriched the experience of the child as compared to control groups across the nation. More importantly, information obtained from Head Start evaluations reflected the variance of program inputs; it was this variance which tended to limit any gross generalizations from the data. Data showed some programs to be effective for certain cases, and noneffective for other cases.

With the publication of the Westinghouse Learning Corporation Report on the study of the National Impact of Project Head Start came the first evaluation of the program's net effect on the children in primary school grades across the country. Although this study, which focused solely on the cognitive and affective development of the child, did not measure the immediate effects of summer or year-long programs, it did report that summer programs appeared to be ineffective in producing any gains in cognitive and affective development that persisted into the early elementary grades, and that full year programs appeared to be ineffective as measured by tests of affective development, but were marginally effective in producing gains in cognitive development which were detectable in grades one, two or three.

Questions have been raised by reviewers on almost every aspect of the Westinghouse report. A general conclusion of several of these reviewers is that the report had too many limitations for it to be the sole indicator of the success or failure of Head Start or any form of early intervention as an aid to the development of low income children. Moreover, the controversy with regard to the validity of the Westinghouse Report has raised a more basic issue: what actually do we know about the impact of any type of preschool intervention program?

The present report is based on the assumption that the answer to this question may be more closely approximated by reviewing the findings of small, controlled long-term evaluations of programs in various parts of the country.

Eight researchers with available longitudinal data on preschool intervention programs were asked to contribute. The researchers were requested to follow a format which asked "what happened educationally to the child as a result of the program?" Emphasis was placed on the effects of the intervention program on the child's performance in school. Performance was defined in an inclusive sense to incorporate achievement, social attitude, school attendance, health, parental interest in the child, as well as the child's cognitive, perceptual, and linguistic abilities.

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CHAPTER I.

HEAD START GRADUATES IN SCHOOL: STUDIES IN NEW HAVEN, CONNECTICUT[1]

Willa D. Abelson

INTRODUCTION

Several years before the national Head Start project was organized, a nursery school program was started in New Haven, Connecticut to try to improve the preparation of children from poverty areas of the city for public school. The program later became part of Head Start, but even before this, investigators at Yale University had begun studying its impact on children's intellectual and social-emotional development. In this chapter, we have brought together our research findings concerning the effectiveness of this Head Start program in enhancing the progress made by poor children during their first years in public school.

The 21 Head Start or Child Development Centers[2] in New Haven provide a year-long nursery school experience for approximately 650 children each year. The children come from low income families in inner city areas or public housing projects. They are predominantly black, although there has been an increasing number of Puerto Rican children enrolled in recent years.

The program that has evolved is geared to multiple needs of poor children and their families. The curriculum focuses on language development and basic conceptual knowledge, and classroom activities foster the development of social skills and emotional maturity—especially self-confidence and independence. A good deal of attention is given to the children's medical needs and physical well-being.

Parents participate in this Head Start program through a Policy Advisory Council which is involved in making decisions and formulating policies for the program, and through a career development project. All of the teacher aides are parents of children in Head Start classes, and 10 of the present 21 head teachers are parents who started as teacher aides and then completed their education through this program.

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[1] The studies reported in this paper were carried out in collaboration with Edward Zigler, Professor of Psychology and Director of Child Development Program, Yale University. Major support came from Research Grant MH-03008 from the National Institute of Mental Health, United States Public Health Service; Grant OEO-2405 from the Office of Economic Opportunity; and the Gunnar Dybwad Award of the National Association for Retarded Children. The author wishes to express appreciation to Robert P. Abelson and Sally Z. Styfco for their critical reading of the manuscript; and to Ann Mann for her assistance with its preparation.

[2] The New Haven Head Start program is run by an administrative team composed of a director, psychologist, social worker, two curriculum coordinators, and two parent program coordinators. Each center has a head teacher and a teacher aide. We are grateful for the assistance and cooperation which the director, Mrs. Grayce Dowdy, and her staff have given to the Yale research group.

The evidence gathered by Yale researchers over the past seven years demonstrates very clearly that the New Haven program, like other extensive preschool programs (cf. Gray & Klaus, 1966), has an immediate, positive impact on children's adjustment to school and on their intellectual competence. An early investigation (Zigler & Butterfield, 1968) found significant IQ gains in children attending Head Start classes, but no gains in neighborhood children who were not in the program. The results suggested that the more optimal intellectual performance following nursery school experience was attributable to changes in affective-motivational reactions rather than to an improvement in formal cognitive functioning per se.

This finding was investigated further in a recent study (Abelson, Zigler, & Levine, 1971). Two groups of children who performed at the same level on the Stanford-Binet Intelligence Scale (Terman & Merrill, 1960) before the Head Start classes opened, showed equal IQ gains when they were retested two months later. However, the children who attended Head Start classes made a further IQ gain by the end of the year, while the children who did not attend classes dropped back to their initial IQ level. The children also exhibited differential changes in behavioral characteristics during the year. The results suggest that, among other effects, nursery experience helps alleviate interpersonal reactions such as wariness and mistrust—reactions which prevent many of the children from performing up to their intellectual capabilities in cognitive-demand situations.

Results from other studies have suggested that this preschool education is particularly important to these inner city children whose cognitive development is most depressed. On measures of psycholinguistic abilities and conceptual maturity, for example, it was found that those Head Start pupils who performed most poorly on initial tests made the largest gains when they were retested after five to six months of Head Start experience. In contrast, children who were equally poor on initial tests and who did not attend Head Start made smaller gains than other children when they were retested.

These various studies provide quite conclusive evidence that the New Haven Head Start program has an immediate positive impact on children's psychological development. In this paper, we report our findings concerning the long-range significance of this early intervention, particularly with respect to later progress in school.

We first pursued this question by studying the comparative progress of the Zigler-Butterfield Head Start subjects and their non-Head Start classmates in inner city schools over a period of two years. More recently, we retested the Abelson, Zigler, and Levine subjects (both Head Start and non-Head Start) at the end of their first year of school. These follow-up findings are reported in the next section of the paper. In the section following, interim results will be presented from an ongoing longitudinal study of the impact of Head Start when it is succeeded by different types of public schooling. The progressive development of Head Start graduates who are being bussed to an experimental Follow Through program for their kindergarten through third grade schooling is being compared with that of children who are attending regular inner city schools. Kindergarten and first grade results have been compiled and will be reported here.

Follow-Up Studies

One hundred seventy-five children were followed up in school. The children are all from poor families in inner city areas of New Haven. The majority is black and none of the children in these studies is bilingual.

Thirty-seven children who had been Head Start subjects in the Zigler-Butterfield study were compared through kindergarten and first grade with 23 children in their classrooms who had been eligible but had not attended Head Start. More recently, 74 Head Start and 41 non-Head Start subjects from the Abelson, Zigler, & Levine study were followed up in kindergarten.[3] Academic achievements, intellectual development, and personal-social adjustment in kindergarten and first grade have been evaluated.

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[3] The high mobility rate characteristic of low income urban families, and well-documented among New Haven school children (Levine, Wesolowski, and Corbett, 1966), has been a significant problem in the collection and analysis of these follow-up data. In addition to the loss of subjects who move out of the city, groups of children tend to become dispersed rather rapidly with the city. Subjects in the first grade follow-up, for example, had originally lived in three school districts but were located in seven schools two years later. The 115 subjects in the recent follow-up were located in 14 different New Haven schools at the end of kindergarten. Such scattering unfortunately prohibits analyses of inter-classroom or even inter-school variations in school progress, because too few subjects are available in any one setting.

Intellectual performance in kindergarten. Two different measures administered in the follow-up investigations indicate that children who have attended Head Start are superior in intellectual development to their non-Head Start inner city classmates after one year in school (see Table 1). In the Zigler-Butterfield follow-up, Head Start graduates scored significantly[a] higher at the end of kindergarten on the Draw-A-Man measure of conceptual maturity (Harris, 1963). In the recent follow-up, when the Stanford-Binet was re-administered to Head Start and non-Head Start subjects at the end of kindergarten, the Head Start subjects performed significantly better. These subjects had performed comparably prior to preschool educational intervention but had differed at the end of the Head Start program. The sequential results demonstrate that the difference in the intellectual competence of these children emerged solely during the Head Start term, for the IQ levels of both groups do not change by more than one or two points during kindergarten.

Academic progress in kindergarten. The small amount of data available in the first follow-up study suggests that Head Start pupils do not possess greater knowledge and information when they enter school (see Table 2, Preschool Inventory results). However, at the end of kindergarten, boys who had attended Head Start demonstrated significantly greater skills and mastery of concepts such as colors, letters, and size on the Preschool Inventory (Caldwell & Soule, 1965-66) than boys who had not attended Head Start. This finding suggests that the effect of the Head Start experience was to enhance the learning responsivity of boys—an issue we will return to later.

These four samples ranked in the same order of performance on the Metropolitan Readiness Tests (Hildreth, Griffiths, & McGauvran, 1966) as they did on the Preschool Inventory (Head Start and non-Head Start girls highest, non-Head Start boys lowest). However, the differences among the groups were not significant on this measure.

Readiness tests were not administered in the recent follow-up study, but Monroe Reading Aptitude Test (Monroe, 1935) scores taken from school records were analyzed. The rank order of groups in overall performance at the end of kindergarten is the same as in the earlier study—Head Start and non-Head Start girls

TABLE 1

IQ SCORES OF HEAD START AND NON-HEAD START GROUPS
AT THE END OF KINDERGARTEN

	Head Start		Non-Head Start	
Early Follow-Up Study	**Boys**	**Girls**	**Boys**	**Girls**
Goodenough-Harris Draw-A-Man Test	94.37 (N = 19)	94.38 (N = 13)	81.67 (N = 12)	86.54 (N = 11)
Recent Follow-Up Study				
Stanford-Binet Intelligence Scale, form L-M	92.28 (N = 36)	92.03 (N = 38)	88.79 (N = 19)	86.27 (N = 22)

Numbers of cases are shown in parentheses.

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[a] All differences reported as significant reach [illegible] statistical probability level of .05 or less.

TABLE 2
ACHIEVEMENT TEST SCORES OF HEAD START AND NON-HEAD START GROUPS IN KINDERGARTEN

	Head Start		Non-Head Start	
	Boys	Girls	Boys	Girls
Early Follow-Up Study				
Preschool Inventory (63 items)				
Beginning of Kindergarten	28.94	41.18	27.29	36.00
End of Kindergarten	37.82	47.82	31.00	47.33
	(N = 17)	(N = 11)	(N = 7)	(N = 3)
Metropolitan Readiness Test, Form A				
End of Kindergarten Percentile Rank	32nd (N = 17)	44th (N = 13)	20th (N = 12)	36th (N = 11)
Recent Follow-Up Study				
Monroe Reading Aptitude Tests				
End of Kindergarten Percentile Rank	44th (N = 22)	48th (N = 24)	42nd (N = 17)	48th (N = 20)

highest, non-Head Start boys lowest. On one of the Monroe sections—visual tests—Head Start pupils performed significantly better than non-Head Start pupils, irrespective of sex.

We compared Head Start and non-Head Start children on a critical index of school success at this first major juncture of their school career; promotion to first grade. The samples in the two follow-up studies were combined and the frequency with which Head Start and non-Head Start subjects were promoted to first grade as opposed to reading readiness classes was analyzed. The results are shown in Table 3. Eighty-two percent of the Head Start subjects were promoted to first grade, while 18% were assigned to reading readiness classes after kindergarten. Sixty-five percent of the non-Head Start subjects were promoted to first grade, while 35% were assigned to reading readiness classes. The difference between the groups is statistically significant[5] and suggests that in inner city schools children who have had Head Start experience are more likely to achieve an adequate level of competence in kindergarten.

TABLE 3
PROMOTION OF HEAD START AND NON-HEAD START PUPILS

	Head Start Pupils	Non-Head Start Pupils
Promoted to First Grade	53 (82%)	35 (65%)
Assigned to Reading Readiness Classes	12 (18%)	19 (35%)
	65 (100%)	54 (100%)

Personal-social adjustment in kindergarten. Our information regarding the initial school adjustment of Head Start pupils is sparse in these two follow-up studies though it is evident from the data which was gathered that teachers' ratings on the Operation Head Start Behavior Inventory favor the Head Start pupils (see Table 4). At the end of kindergarten, the ratings of these same children indicate that the non-Head Start boys remained more immature than the Head Start boys, and more immature than girls generally.

We also analyzed the marks which pupils received for behavioral adjustment in kindergarten. The results are inconclusive, for in the early follow-up study, Head Start pupils received significantly higher marks for initiative and somewhat higher marks for industry than non-Head

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[5] $\chi^2 = 4.28, p \leq .05$

TABLE 4

PERSONAL-SOCIAL ADJUSTMENT RATINGS OF HEAD START AND NON-HEAD START GROUPS IN KINDERGARTEN

	Head Start		Non-Head Start	
Early Follow-Up Study	Boys	Girls	Boys	Girls
Operation Head Start Behavior Inventory[a]				
Fall of Kindergarten	143.00	148.53	127.11	122.33
Spring of Kindergarten	141.32	147.73	131.11	174.33
	(N = 22)	(N = 15)	(N = 9)	(N = 3)
Kindergarten Marks[b]				
Cooperation	10.29	11.23	10.25	11.82
Industry	11.18	11.25	8.75	11.00
Initiative	9.42	11.00	7.75	9.91
Dependability	10.47	10.31	9.25	11.27
Social Control	10.65	11.00	9.75	11.60
	(N = 17)	(N = 13)	(N = 12)	(N = 11)
Recent Follow-Up Study				
Kindergarten Marks[b]				
Cooperation	9.43	10.00	9.95	10.32
Industry	9.56	9.75	8.63	10.18
Initiative	8.96	9.54	9.00	9.77
Dependability	9.35	10.83	9.32	10.32
Social Control	8.83	10.67	9.42	10.09
	(N = 23)	(N = 24)	(N = 19)	(N = 22)

[a] Possible range of scores = 50–200

[b] Letter values of marks are:
14 = A, 13 = A-, 12 = B+, 11 = B, 10 = B-
9 = C+, 8 = C, 7 = C- . . .

Numbers of cases are shown in parentheses.

Start pupils; while in the recent follow-up study, these differences were not found. Whether this discrepancy is due to a sampling difference, or to some other factor, is difficult to determine. Conclusions should be reserved for the moment, in any case, since the impact of Head Start on personal-social adjustment in school will be taken up again when we present the more extensive results of the longitudinal study.

Before going on to the first grade results, we would add that data gathered in the recent follow-up indicate that children who did not attend Head Start tended to be absent more frequently during kindergarten than the children who did attend Head Start. Non-Head Start pupils were absent more than 28 days during kindergarten, on the average; while Head Start pupils were absent a little less than 23 days.[6] This difference could stem from a number of factors—better physical health of Head Start graduates, for example, and greater motivation for school in Head Start graduates and their parents.

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[6] These figures are based on the school records of 71 Head Start pupils and 41 non-Head Start pupils. The difference closely approaches statistical significance ($p < .07$).

First grade follow-up. In the Zigler-Butterfield follow-up, we tested each of the children on the Stanford-Binet Intelligence Scale after they had been in school for nearly two years, and investigated their academic progress by analyzing the marks they received at the end of first grade. The results are summarized in Table 5.

Children who had Head Start experience still tended to show a general advantage in intellectual development after two years in school, but it is only among boys that Head Start is still associated with significant superiority in intellectual and academic performance. Boys who had attended Head Start achieved significantly higher IQ scores on the Stanford-Binet and significantly higher marks for reading achievements in first grade, and they tended to receive higher marks for classroom behavior, than did non-Head Start boys. Head Start and non-Head Start girls, on the other hand, did not differ significantly in these areas. In this study, then, the impact of Head Start continued to be evident after two years of school only among boys.

SUMMARY

These two follow-up studies provide comparative data on inner city children which indicate that the New Haven Head Start experience helps children to progress more optimally in inner city schools. Children who attend Head Start are clearly more competent in meeting intellectual challenges during their first year of school than children who did not attend Head Start. The superior intellectual performance of Head Start pupils in kindergarten was corroborated in both studies with different types of measures. The more recent findings provide the clearest demonstration of the long-term impact of Head Start on intellectual development, since the children who were compared were known to have performed similarly prior to Head Start intervention. At the end of the year in school, the Head Start graduates in that study were maintaining the higher IQ levels which they had reached by the end of Head Start, whereas the non-Head Start children were continuing to perform at a lower level.

TABLE 5

ATTAINMENTS OF HEAD START AND NON-HEAD START GROUPS AT THE END OF THEIR SECOND YEAR OF SCHOOL (EARLY FOLLOW-UP STUDY ONLY)

	Head Start		Non-Head Start	
	Boys	Girls	Boys	Girls
Stanford-Binet IQ Scores	90.94	97.92	81.58	93.45
School Marks[a]				
Cooperation	9.94	11.69	10.08	12.64
Industry	10.59	11.23	8.58	10.70
Initiative	9.53	10.69	7.58	10.46
Dependability	9.53	10.54	8.50	10.91
Social Control	9.29	10.39	8.50	10.91
	(N = 18)	(N = 13)	(N = 12)	(N = 11)
Reading[b]	9.46	9.42	7.29	10.78
Arithmetic[b]	9.85	9.42	8.71	10.44
	(N = 13)	(N = 12)	(N = 7)	(N = 9)

[a] Letter values of marks are:
14 = A, 13 = A-, 12 = B+, 11 = B,
10 = B-, 9 = C+, 8 = C, 7 = C-. . .

[b] These N's are smaller because reading and arithmetic marks are usually given only to pupils who are in the first grade classes.

Numbers of cases are shown in parentheses.

Although one difference was found in the performance of Head Start and non-Head Start samples on standardized readiness tests at the end of kindergarten, a significantly higher percentage of the Head Start graduates were promoted to first grade at this time. Promotion reflects teachers' judgments of children's academic readiness, so despite the relative absence of supportive evidence from the standardized test results, it would appear that Head Start is helping children to progress better in school.

The findings of the second-year follow-up of the Zigler-Butterfield subjects suggest that Head Start experience may make more difference over the long run to boys than to girls. The non-Head Start girls in that study caught up to their Head Start girl classmates in learning achievements and personal-social adjustment during kindergarten, and they had almost reached a comparable level of intellectual development by the end of first grade. In contrast, the boys in these classrooms who did not have Head Start experience exhibited little improvement in either behavioral adjustment or learning achievements during kindergarten. At the end of their second year in school, these boys continued to be somewhat poorly adjusted, and their reading achievements and general intellectual level remained significantly poorer than the boys who had had Head Start experience.

A LONGITUDINAL STUDY OF HEAD START PUPILS IN TRADITIONAL AND EXPERIMENTAL SCHOOL PROGRAMS

Method

A longitudinal study which we are conducting on the development of inner city children attending a Follow Through program provides evidence regarding the long-term impact of Head Start when it is followed by different types of school experiences. The local Follow Through center[2] differs rather notably from most inner city school situations. Bank Street College of Education is a sponsoring institution for the program and assists in curriculum development and in-service staff training. In addition, medical and social services, child development consultation, and other professional activities are built into the school program.

The Follow Through center emphasizes individualized instruction. The pupil-teacher ratio is low with a maximum of 20 children for every full-time team of teacher and aide. Each classroom includes children from widely divergent backgrounds. Most pupils are from either low income, inner city families or middle-to-upper income families living in outer-urban or suburban areas. All Follow Through pupils are bussed to the center for a full day of school, even in kindergarten. Although the center is not near children's homes, parents are involved in school activities and in setting the administrative policy of the program.

The progressive performance of low income pupils in this Follow Through program is being compared with the performance of a similar sample of children who are undergoing the range of education opportunities and experiences traditionally encountered in inner city schools. The comparison pupils are attending New Haven schools which serve low income populations. Family history information shows that these Follow Through and neighborhood school samples are comparable with respect to type of parent occupation, family size, and residence; although there is a higher incidence of one-parent families in the Follow Through sample (32% as compared to 17% of the neighborhood sample). All the families meet eligibility requirements of the Head Start program.

The findings are based on the performance of 177 children. The 112 Follow Through pupils began the program either the first or second year after it was initiated. The 65 children with whom they are compared were in four kindergarten classes, each in a different neighborhood school. Eighty-eight Follow Through and 22 neighborhood school pupils had attended a year-long Head Start program; 24 Follow Through and 43 neighborhood school pupils had not had any preschool educational experience. The majority of the pupils is black. None is bilingual.

All data were collected by Yale research staff. Measures employed to study intellectual and academic development include the Peabody Picture Vocabulary Test (Dunn, 1965), the Screening Test of Academic Readiness (Ahr, 1966), the Preschool Inventory (Caldwell & Soule, 1965-66), and the Metropolitan Achievement Tests, Primary Batteries I and II (Bixler,

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[2] The cooperation of the New Haven and Hamden, Connecticut, Public Schools is gratefully acknowledged. We are particularly indebted to Mr. Robert Avery, Director of the Hamden-New Haven Cooperative Education Center, and the Follow Through program staff for their continuing assistance.

Durost, Hildreth, Lund, & Wrightstone, 1958-62). We also report findings pertaining to children's personal and social adjustment in kindergarten and the findings from a battery of non-academic measures which was used to explore some dimensions of competence during first grade.

Results

Academic achievements. It was found that the achievements of the children when they first entered school, and their learning progress during the first year of school, tended to be related to their sex and race as well as to their educational experience. The interweaving of these factors may be seen in the data which was gathered during the first year of the study. Tables 6 and 7 show the mean scores for Head Start and non-Head Start groups that year, broken down for race. Results of the Preschool Inventory, which was administered individually to each child at the beginning of kindergarten, revealed that black children who had Head Start experience had significantly higher scores than black children who did not have this experience (Table 6). The black Head Start graduates demonstrated significantly better knowledge of concepts such as position and color; greater information and vocabulary; and greater ability to employ concepts correctly in the solution of problems.

On the Screening Test of Academic Readiness, analyses also revealed a significant Head Start difference among black children but only for boys: boys who did not attend Head Start scored significantly lower at school entrance than boys who did attend Head Start. The Head Start boys and both Head Start and non-Head Start girls performed comparably.

The amount of learning accomplished during kindergarten also appears to be related to many factors, including both the past and current educational experiences of the children. There was a general tendency for children in Follow Through kindergartens to make greater gains in learning readiness skills than children in inner city school kindergartens. However, white pupils in inner city schools exhibited gains on the readiness tests which were the same as those of both black and white pupils in the Follow Through program. It was the black pupils in inner city schools who made significantly smaller gains during kindergarten; especially, as the data in Table 7 indicate, the non-Head Start black pupils in these schools, who gained the least.

These test results show, then, that non-Head Start black children not only entered school with the least accomplishments, they also learned less during kindergarten if they were in the usual type of school program.[8] In relation to norms reported for the Screening Test, it could be concluded that this was the only group of children in the study which was substantially deficient in readiness skills at the end of kindergarten, for their mean standard score[9] was 87 – 13 points below the average performance of children this age. By contrast, children

TABLE 6

ACHIEVEMENT PERFORMANCE OF HEAD START AND NON-HEAD START GROUPS AT THE BEGINNING OF THE FOLLOW THROUGH STUDY

	Black Pupils		White Pupils	
	Head Start (N = 54)	Non-Head Start (N = 35)	Head Start (N = 14)	Non-Head Start (N = 17)
The Preschool Inventory	36.73	29.69	40.86	39.11
Screening Test of Academic Readiness	30.70	29.80	38.36	36.41

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[8] Monroe Reading Aptitude Test Scores were available for pupils attending three of the four participating inner city schools. The results indicate that the Head Start graduates also scored significantly higher on the Monroe tests at the end of kindergarten than their classmates who had not attended Head Start. The mean total score of Head Start pupils was 195 (15 pupils); the mean total score of non-Heat Start pupils was 170 (35 pupils). Boys and girls did not perform differently.

[9] On the Screening Test of Academic Readiness, an average level of performance is assigned a standard score of 100, the standard deviation is set at 15.

TABLE 7

KINDERGARTEN ACHIEVEMENT GAINS OF HEAD START AND NON-HEAD START GROUPS IN FOLLOW THROUGH AND NEIGHBORHOOD SCHOOLS

(Screening Test of Academic Readiness)

		Follow Through	Neighborhood Schools
Black Pupils	Head Start	19.81 (N = 37)	17.06 (N = 17)
	Non-Head Start	21.86 (N = 7)	14.29 (N = 28)
	Overall	20.14 (N = 44)	15.33 (N = 45)
White Pupils	Head Start	18.80 (N = 10)	21.75 (N = 4)
	Non-Head Start	22.25 (N = 4)	20.54 (N = 13)
	Overall	19.79 (N = 14)	20.82 (N = 17)

Numbers of cases are shown in parentheses.

who had had some type of educational intervention by the end of kindergarten (Head Start and/or Follow Through) were close to or at an average level of performance for their age. The Follow Through pupils had a mean standard score of 100, the Head Start pupils in neighborhood schools had a mean standard score of 96.

The Screening Test results for the second-year Follow Through class were similar to those for the first-year class, as reported above. Both Head Start and non-Head Start pupils in that class made an average increase of 19 -- 20 points during kindergarten, and they attained a standard score mean of 98 at the end of the year.

Metropolitan Achievement Tests were administered to assess the children's progress in reading and arithmetic at the end of their second year of school. On these tests no differences were found in the academic achievements of Head Start and non-Head Start pupils in either type of program. In general, children who remained in the Follow Through program for two years were exhibiting somewhat greater reading achievements than children who remained in the same neighborhood schools for two years. The first-year Follow Through class tends to score higher than the comparison sample in reading comprehension; the second-year Follow Through class tends to score higher in work discrimination. These differences only approach statistical significance, however. (The mean readiness test scores of these smaller longitudinal samples are presented in Table 8 to show that the children who remained in these programs for two years did not differ in achievements prior to first grade.)

Intellectual development. The following results concern the children's sequential performance on the Peabody Picture Vocabulary Test (PPVT) during kindergarten and first grade. Unlike the achievement tests, which measure specific skills and knowledge, the PPVT assesses general verbal intellectual development and it employs a technique which does not depend on language or reading abilities.

Head Start experience was an important effect in the PPVT kindergarten results. The findings for the entire sample of 177 children indicate that, at school entrance, Head Start pupils performed at a significantly higher level of intellectual maturity than non-Head Start pupils. Head Start pupils scored 12 IQ points higher, on the average. At the end of the year, Head Start experience

TABLE 8

SEQUENTIAL ACADEMIC ACHIEVEMENT OF FOLLOW THROUGH AND NEIGHBORHOOD SCHOOL LONGITUDINAL GROUPS

(Combined Head Start and Non-Head Start)

		Kindergarten Entrance	End of Kindergarten	End of Grade 1			
		Screening Test of Academic Readiness (Raw Scores)	Screening Test of Academic Readiness (Raw Scores)	Metropolitan Achievement Tests, Primary Battery I (Grade Equivalents)[a]			
				Word Knowledge	Word Discrimination	Reading Comprehension	Arithmetic
Follow Through							
2nd yr class	(N = 45)	29.39	48.60	1.7	1.8	1.5	1.7
1st yr class	(N = 38)	30.38	50.44	1.7	1.6	1.6	1.7
Neighborhood Schools	(N = 37)	35.40	48.86	1.6	1.6	1.5	1.7

[a] In the grade equivalent figures, the number to the left of the decimal refers to the school year, the number to the right of the decimal refers to the month in that year; e.g. 1.7 = the seventh month of grade 1.

was still a significant factor in verbal intellectual performance, but only among black pupils in the two types of school program.

Table 9 shows the progressive performance levels of Head Start and non-Head Start pupils who were in these schools for two years. These longitudinal data illustrate the exceptionally poor performance on this test which we have found to be typical for poor children who have not yet had a school experience. They also show that both Head Start and non-Head Start pupils perform better at the end of kindergarten than they did at the beginning. PPVT gains in first grade were significantly related to the type of school program which the children were attending. In both the first- and second-year classes of the Follow Through program, Head Start pupils made a further increment in their level of intellectual functioning during first grade. In regular school programs, Head Start pupils showed no further increment. As a result, Head Start groups which had performed comparably after one year of school, began to differ after two years of school.

The small number of non-Head Start pupils in the Follow Through group had caught up to their Head Start classmates by the end of the second year, whereas pupils who missed *both* the Head Start and Follow Through programs remained at a lower level of verbal intellectual development than the other children.

Personal-social adjustment. Analyses of teachers' ratings of 50 behavioral characteristics of their pupils in kindergarten revealed many differences which were associated with Head Start experience. No systematic differences were found in the ratings of Follow Through and neighborhood school teachers' ratings of their pupils. Across both school programs, non-Head Start pupils were rated lower on leadership, and non-Head Start boys were rated as less independent, at both the beginning and end of kindergarten. In the neighborhood schools, Head Start graduates were also rated significantly more self-confident, persistent, and emotionally mature than non-Head Start pupils.

Though one would expect that children this age would mature socially and emotionally over a year's time, we find that only one-half of the pupils in this study were rated higher by their teachers at the end of kindergarten on this 50-item measure, the Operation Head Start Behavior Inventory. The children who were the most immature when they entered school did not necessarily improve.[10] Incidentally, because the Inventory ratings correlated rather substantially with

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[10] There is a small negative correlation ($r = -.28$) between initial adjustment rating and rating change.

TABLE 9

SEQUENTIAL PPVT IQs OF FOLLOW THROUGH AND NEIGHBORHOOD SCHOOLS

Longitudinal Groups

	Kindergarten Entrance	End of Kindergarten	End of Grade 1	IQ Change in Kindergarten	IQ Change in Grade 1
Follow Through					
Head Start (N = 72)	84.82	94.96	98.58	+ 10.14	+ 3.62
Non-Head Start (N = 8)	78.12	89.12	96.00	+ 11.00	+ 6.88
Neighborhood Schools					
Head Start (N = 14)	86.64	96.64	94.86	+ 10.00	- 1.78
Non-Head Start (N = 31)	69.81	91.90	90.61	+ 22.09	- 1.29

academic performance,[11] we conjectured that the amount of learning which children accomplished during the kindergarten year might be related to their personal and social adjustment in school. The available evidence suggests that this is true; for it was found that children who were very immature when they began kindergarten, but who matured significantly during the year, made significantly larger gains on the readiness test than those who remained poorly adjusted.

Competence. Near the end of the second year, a battery of six measures was administered to the children in first grade in an attempt to determine whether there were systematic differences in problem-solving and task performance resulting from the kinds of educational experiences which children had had. Analyses were performed to compare Head Start pupils in the Follow Through program with Head Start and non-Head Start pupils in regular school programs.

We found, first, that Head Start pupils—regardless of the school program they were attending—adopted a different approach to problem-solving than did non-Head Start pupils. On a measure described by Zigler and Turnure (1964) called the Sticker Game, the extent to which children imitate someone else rather than using their own ideas is assessed. The results on this measure showed that Head Start pupils imitated significantly less than non-Head Start pupils when they first coped with the Sticker Game task. The Head Start pupils thus appeared to adopt a more inner- or self-directed approach to problem solving.

During the Sticker Game, the spontaneous verbal behavior of the children was also scored. The children commented about themselves, their school, or about what they were doing with the stickers. Very few asked questions or requested help or support. Analyses of these spontaneous verbalization scores show a significant education effect. Head Start pupils in the Follow Through program engaged in spontaneous verbal behavior more frequently than Head Start or non-Head Start pupils in neighborhood school programs. Whereas Head Start pupils attending Follow Through averaged more than nine comments during the course of the three Sticker Game tasks, the pupils in regular school programs averaged less than three comments. This finding suggests that the children attending Follow Through are more comfortable and confident expressing themselves verbally—a behavioral difference which is consistent with the finding that they were making unusual increments in their knowledge of word concepts. Our data showed that Head Start pupils in the Follow Through program verbalized as freely as their classmates who were from high income families.

We measured exploratory or "change-seeking" behavior with the Howard Maze task (Howard, 1961). On this measure, the Head Start pupils in Follow Through displayed significantly greater exploratory tendencies than the Head Start pupils who were in regular school programs.

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[11] Correlation coefficients of ratings on the Operation Head Start Behavior Inventory and scores on the Screening Test of Academic Readiness were +.51 (fall measures) and +.53 (spring measures).

We did not uncover significant differences between Head Start or school groups on a measure of persistence.

Two measures were employed to study creativity. A measure of creative thinking in verbal activities was adapted from the "Just Suppose" task devised by Torrance (1966); and Torrance's "Circles" task was used to assess creativity in a non-verbal activity. On the latter, no clear-cut differences were uncovered which could be associated with educational experiences. On the verbal task, however, Head Start graduates in both Follow Through and neighborhood schools demonstrated significantly greater creativity than non-Head Start pupils in neighborhood schools. On both of the Torrance tasks the Head Start graduates in the Follow Through program gave significantly longer responses than did the Head Start pupils in neighborhood schools.

In sum, nearly two years after starting school, Head Start graduates were more verbally creative and relied on their own resources more than their classmates who had not attended Head Start. Those Head Start graduates who had had two additional years of enriched education in the Follow Through program were found to verbalize more frequently and more fully, to give lengthier responses, and to be more exploratory, than children who were attending regular school programs. These behavioral differences suggest that the children who had had the greatest educational advantages were more comfortable communicating with others and working on unfamiliar tasks than the children who had not had such advantages.

DISCUSSION

The evidence from several long-term investigations carried out over the past six years in New Haven has been brought together in this report to assess the impact of Head Start intervention on the progress of inner city children in school.

The results of all our investigations indicate that inner city children are better prepared to start school if they have had Head Start experience. In each study, Head Start graduates performed significantly better on intelligence tests, and they were socially and emotionally more mature at the beginning of kindergarten than children who did not have Head Start experience. The most recent evidence also suggests that basic conceptual knowledge and perceptual-motor skills were improved in Head Start classes.

The progressive performance of children during the two years following Head Start was studied in different school situations to try to assess the consequences of this initial developmental advantage under varying educational conditions. Where children attended inner city kindergartens without special programs or resources available, the evidence consistently indicates that Head Start graduates remained at a higher level of intellectual functioning, demonstrated greater maturity and self-confidence, and seemed to benefit more from the learning opportunities provided for them in these schools, than did children who had not attended Head Start. The higher percentage of Head Start graduates who were promoted to first grade underlines these positive findings in the test results.

The kindergarten findings in a recent longitudinal study suggest that the impact of early educational intervention is particularly important to black children, who make up the inner city majority. Among the black children in this study, the more optimal school situation at a Follow Through center led both the Head Start graduates and their few non-Head Start classmates to make greater learning gains during kindergarten than the Head Start and non-Head Start children attending inner city school kindergartens. But, it was only those children who had not had the benefit of *any* educational intervention—either in Head Start before school entrance or in Follow Through after school entrance—who did not have the necessary skills at the end of kindergarten to begin a first grade program. These children were not only farther behind in their cognitive development at school entrance, but they learned less during kindergarten. This was also the case for boys in another follow-up study, most of whom were black, who had not had Head Start experience before entering inner city schools.

In the unusual school situation at the Follow Through center, the small number of non-Head Start children who were included caught up to their Head Start classmates by the end of the first year. This did not occur in any of the more typical school situations. Whether this would have occurred in the Follow Through program if the majority of children had not had Head Start experience is, of course, a question which cannot be answered. In any case, we may infer from these results that one of the important consequences of Head Start preparation is that it enables many inner city children to take greater advantage of the learning opportunities which are typically provided in their neighborhood schools.

The results of the two studies which followed children on through their second year of school showed that Head Start graduates still tend to perform better than non-Head Start graduates the second year. The results of the first follow-up study suggested that the consequences of Head Start preparation may be greater for boys than for girls, since by the end of first grade, girls without this preschool experience had caught up to Head Start girls in every area tested; whereas boys without this preschool experience showed no indications of catching up to Head Start boys in at least two important areas; intellectual development and reading achievements.

Of timely interest is the evidence from the recent Follow Through study that the development of Head Start graduates begins to vary according to the type of school program which they have after leaving Head Start. The Head Start graduates in the enriched school program of the Follow Through center continued to show improvement in their verbal IQ level, but neither Head Start graduates nor non-Head Start pupils in regular school programs made further IQ gains after leaving kindergarten.

The Head Start graduates who were attending the Follow Through program also performed differently from other Head Start graduates at the end of first grade in ways which suggested that they were more comfortable communicating with others and working on new materials and problems than those who had not had this type of schooling. In general, though, first graders who had had Head Start experience were more creative and relied on their own resources more than non-Head Start first graders. Thus the greater initiative and independence displayed by Head Start graduates in their kindergarten classes seemed to be continuing, regardless of the type of school program they were in.

The findings of this study imply that school program is the most important factor influencing children's progress in academic subjects that are not formally introduced until the primary grades. No Head Start effects were uncovered in the analyses of achievement test performance at the end of first grade, but the children in the Follow Through program seemed to be making greater progress in mastering reading skills than the children in regular school programs.

The findings of these three studies thus provide quite conclusive evidence that Head Start has an impact on children's development which is beneficial to them in school. The results show that the experiences which Head Start provide are particularly important for black children and that the consequences of the Head Start preparation may be greater for boys than for girls. As would be expected, the children's development comes to depend on the type of education experiences which they have after leaving Head Start. The Follow Through results indicate that Head Start graduates progress more optimally in school programs which are best geared to meet children's needs for intellectual challenge and interpersonal support. The fact that Head Start graduates in one of the Follow Through classrooms had advanced to grade level in reading and arithmetic and age level in verbal intellectual development by the end of first grade illustrates the success which can be realized through educational efforts mounted on behalf of inner city children.

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CHAPTER 2.

IMPACT OF EARLY EDUCATION ON DISADVANTAGED CHILDREN

E. Kuno Beller

INTRODUCTION

The last decade has witnessed an increased concern with extending education downward to younger children so as to counteract the immense waste of human potential which has resulted from leaving the mental, social, and emotional development of young children exposed to uncontrolled forces which all too often deform and destroy potential talent and future manpower. The rights of children to an opportunity for educational experiences which will enable them to develop whatever talents they might have so as to function more adequately and productively in their adult life are not taken for granted in our adult-centered society. Apparently, these rights and validity of claims for their potential benefit of exposure to educational experiences early in life have to be demonstrated time and again in order to turn the observations and insights of John Locke, Jean Jacques Rousseau, Pestalozzi, Montessori, and John Dewey into a viable institution in our society.

The present study was undertaken to investigate the interplay of motivation, socio-emotional interactions between the child and his educators in the impact of early educational intervention on the later development of disadvantaged children. The study attempted to concentrate on obtaining a broad spectrum of the child's functioning and changes in the child's functioning over time. The focus was equally on immediate and long-range effects of early educational intervention. By attempting to encompass a wide range of the child's functioning and a broad temporal span it was hoped that we might avoid ending up with fragmented findings which often constitute answers in search of questions rather than answers to questions.

SAMPLING

The children in this study were drawn from four public schools located in an urban slum area of North Philadelphia. Negroes constitute seventy-one percent of the population in the target area. Occupationally, the target area was characterized by unskilled and semi-skilled labor with a small proportion of people in the clerical labor group. There was a hard core of Negro residents without any real work histories and a low level of employability. The employment problem was further intensified by automation and out-migration of industry curtailing the number of unskilled and semi-skilled jobs available. The median income was $3,383. Twenty-seven percent of the housing was classified as "deteriorated" or "dilapidated" in comparison to thirteen percent in the rest of the city.

Each of the four schools opened a nursery program for fifteen four-year-old children. Applicants were recruited through notes to parents of all pupils attending each of the four schools which announced the opening of such a program. The criteria used to identify "eligible" children were: age three years and seven months to four years and six months; children without serious physical or mental handicaps; dependency of family on public services; mothers working; and broken homes. From the applicants from each of the four classrooms, fifteen children were selected randomly for enrollment. Ninety percent of the children were black and all came from lower class deprived families (see Table 1).

TABLE 1

AVERAGE AGES (IN MONTHS), STANDARD DEVIATIONS (SD) OF BOYS AND GIRLS ENTERING SCHOOL AT NURSERY, KINDERGARTEN, AND FIRST GRADE

CHILDREN	*TIME OF ENTRANCE*								
	Nursery			Kindergarten			First Grade		
	N	X	SD	N	X	SD	N	X	SD
Boys	32	56.2	4.1	29	70.9	2.0	27	82.8	3.9
Girls	26	56.1	3.1	24	70.9	3.0	30	84.2	5.6
Total	58	56.2	3.7	53	70.4	2.5	57	83.6	4.9

Fifty-six of the original children graduated to kindergarten in the same four public schools in which they had attended nursery school. Group II consisted of fifty-three five-year-olds who entered the same kindergarten classes as the children of Group I, however, without prior nursery experience. These children were selected from a larger group to approximate age, sex distribution, and ethnic background of the children in Group I. The majority of children in Group I and II graduated from kindergarten to first grade classrooms in the four same schools in which the original program started. All children from Group I and II were assigned to first grade classrooms in each of the four schools in such a way that an equal proportion of children from Groups I and II would have the same teachers. This was done to reduce differential effect of the educational experiences due to differences between classrooms and teachers. From the first grade classrooms in which fifty-eight children of Group I and II were enrolled, a third group of children was selected who had no prior preschool experience. Again these children were selected to be comparable to the age, sex distribution, and ethnic background of children in Groups I and II. All three groups of children were again kept together within the same classrooms and with the same teachers during the second grade. After that time, however, so many children had transferred to different schools in the city that it did not seem practical to continue the battle of keeping the few remaining children in the four original schools in the same classrooms. However, all children were followed up individually each year to the end of the fourth grade although the total sample had spread to eighty different schools in the city of Philadelphia. One hundred and fifty children or approximately ninety percent of the original one hundred sixty-eight children were still reached by the end of the fourth grade. Evidently, a major effort of the present study went into tracing and reaching the children so as to avoid attrition and distortion of results.

The Preschool Program

Each classroom had one head teacher, and one assistant teacher. The head teacher was a fully accredited teacher selected from the staff of the Philadelphia Public Schools who had had previous early childhood teaching experience.

The assistant teacher, in every case, was a Liberal Arts graduate with no teaching experience. The selection of the assistant teacher as a nontrained teacher was a deliberate one. The intention was to encourage persons with teaching potential to enter the teaching field where the challenge was apparent.

The classes operated four days a week. On the fifth day, the teachers were engaged in a continuation of their in-service training program, making home visits, working closely with parents, Home-School Coordinators, the Social Worker, and the school personnel. Where necessary and desirable, they were in contact with appropriate community agencies, although the main responsibility for this work rested with the social service team.

An in-service training program was carried out with the primary objectives to continue the re-education of teachers to work in preschool programs in disadvantaged communities and to begin developing some curriculum guidelines based on the experiences and experimentation in the nursery schools during the past and current years.

Specific objectives were (a) to emphasize the imperative need for the school to help offset or compensate for the deprivation in the lives of disadvantaged children; (b) to help teachers understand (1) basic nursery school procedure and programming; (2) the special needs of the disadvantaged child and the deficits in foundation learning and skills that handicap him when he enters the middle-class academic environment of the school; and (3) the strengths and positive elements in the child and his family which can be utilized in the school setting; (c) to help teachers develop the ability to identify deficits in the total group and in individual children and provide compensatory learning experiences in the preschool program; (d) to experiment with, and evaluate, specific techniques and curriculum materials for helping the disadvantaged child develop the underlying abilities, skills, and understanding necessary to meet successfully the demands of the classroom; and (e) to help teachers recognize the need to reach out to work with the parents of the children.

The total teaching staff met with the Project Director one afternoon a week for a two-hour seminar. During the year, the direction of the curriculum guide changed several times as a result of on-going evaluations of the results. The purpose was to develop guidelines that will be helpful to similar programs but to avoid the "cookbook" type of approach.

The Project Director visited each school as often as possible to observe and confer with teachers concerning their program and their overall performance.

All assistant teachers were required to enroll in a course in child development or nursery school curriculum as part of their in-service education.

The teaching staff sought to establish and maintain a close relationship with parents through home visiting, parent conferences, small group get-togethers, and inviting parents to observe and participate in the group. Much of the work with the parents was informal. Expectations of cooperation from parents varied depending on their interests, confidence, and understanding of the school's goals.

Teachers often sent short notes home telling about something of interest to the parent: the child's adjustment, the program, or some bit of information that was "good news" and served to keep the home and school in a positive relationship. A small booklet containing information of help in planning for their children over the summer was given to the parents at the end of the year. It also listed the various services that were available to the families—welfare and recreational.

The interest of the parents in the program was evidenced by parents' appointments for conferences, health examinations for their children, or with the Social Worker. Several parents participated in the program as an aide to the teacher in the group or on trips. Parents were anxious to discuss their children and the nursery school with the teachers. Parents took responsibility for following suggestions made by teachers and/or the social service staff for helping children at home or functioning more effectively as a family. Many parents referred neighbors to the nursery to enroll their children.

A social worker and four home-school coordinators were employed to offer social services to the parents and children.

The duties of the Social Worker included offering casework services to families with special problems; helping them use community resources; interpreting the goals of the educational and social service aspects of the Nursery School Program to the community.

The Home-School Coordinators, were people who lived in the neighborhood of the school. The selection of neighborhood people was based on the assumptions that: (1) the parents would respond better to someone from their own neighborhood and (2) they would know and understand the people and the problems better than an outsider. One Home-School Coordinator was a graduate student in guidance and counseling. This was an exploration of the effectiveness of using students in such areas.

The Home-School Coordinators' major function was to help establish a close relationship between the nursery school and the families through home visiting and helping families with housekeeping and management problems.

A health program was instituted to secure physical examinations, immunizations and treatment. During the school year, it was noted that several children had eye problems and each was handled on an individual basis. During the school year, the Social Worker had direct contact with several social agencies regarding service to parents.

The program was a traditional one which was concerned more with the child's curiosity for discovery, and with the child's creativity stressing the warm, nurturant, personalized handling of the child by his teachers. An emphasis was placed on developing a program geared to each child's readiness rather than premature introduction of concept and practices in skills which might have a negative influence on the child's interest, cooperation and attitudes. The program attempted to establish a proper balance of self-initiated and structured activities. The structured part of the program was designed to extend the child's knowledge of the world and help him develop the kinds of perceptual discriminations and foundation skills that would facilitate his readiness to benefit from educational programs when he enters formal schooling. The content of the program concentrated on training in language facility, auditory and visual discrimination, listening and paying attention, conceptualization, information about the environment, motor coordination and control, and self-esteem.

In all, the program was child-centered in the sense that an adult provided the child with opportunities to choose from a variety of learning resources, and learning was shaped around the child's needs and preferences. The adult accepted and appreciated divergent reactions of the child and permitted the child to arrange his own individualistic sequences rather than urging the child to follow prescribed ways.

In addition to the intensive planning and in-service training, the program was characterized by a great deal of dedication and enthusiasm on the part of the teaching staff as well as the four principals of the schools in which the program was carried out.

The kindergarten program was a conventional educational program. Although the educational philosophy of the supervising staff was exactly the same as prevailed in the pre-kindergarten program, the ratio of one teacher to thirty children and the sharply reduced supervision and opportunity for daily planning made it extremely difficult to implement a child-centered program.

GENERAL METHODOLOGY

Measurement

A major objective of this study was to employ multiple criteria in the assessment of the impact of early educational intervention on the intellectual and socio-emotional development. Three different types of measures were employed to assess development in the area of intellectual functioning: standardized intelligence tests, measures of academic achievement, and a measure of cognitive style.

Standardized Tests of Intellectual Functioning

The Stanford-Binet Intelligence Test (Terman, L. M. and Merrill, M.A., 1960) and the Goodenough Draw-A-Man Test (Goodenough, F. L., 1962) were administered annually to each child from nursery to the end of the fourth grade. The three tests were selected to obtain a broad base of intellectual functioning for the evaluative study of the impact of early educational intervention on intellectual development. The Stanford-Binet Intelligence Test is made up of a comprehensive battery of items which emphasize equally a variety of dimensions of intellectual functioning, e.g., verbal and nonverbal, comprehension and expression, inductive and deductive reasoning. This test is designed in such a way that it is extremely difficult to extract specific dimensions of intellectual functioning without violating the assumptions underlying their measurement. Thus, the strength of this test lies in its comprehensiveness which is in accord with its theoretical objective of obtaining a measure of "general" intelligence. The weakness of this test results from the fact that it is not as suitable as more specialized tests for the diagnosis of special handicaps and for the evaluation of the effectiveness of techniques instituted to overcome such handicaps. The Goodenough Draw-A-Man Test is primarily a performance measure of intelligence. A major advantage of this test is that it does not require verbal skills on the part of the testee and as a measure of intelligence it is probably less effected by the cultural differences and educational background of the child than verbal tests of intelligence. Moreover, the Goodenough Draw-A-Man Test also involves visual motor coordination which is particularly important at the earlier age levels and implications for self-image which is particularly important in the study of disadvantaged minority groups. Past studies have shown that the Goodenough Draw-A-Man Test is sufficiently correlated with the Stanford-Binet Test to demonstrate its validity, but the correlations are not so high that the two tests cannot be considered to measure different aspects of intellectual functioning. While the Draw-A-Man Test measures primarily expressive intelligence the Peabody Picture Vocabulary Test measures essentially receptive intelligence. Although this test is less well standardized than the Stanford-Binet or Goodenough Test, it has the advantages of being very easily administered, it can be given by non-professional personnel with a minimum of training and it has been used widely in evaluative studies of educational programs for disadvantaged children.

Academic Achievement

Another diagnostic method of intellectual functioning was based on academic achievement in the classroom from the first through the fourth grade. Classroom marks were obtained annually for each child from the files of school records. It has often been pointed out that teacher grades suffer from the fact that they are not standardized and that they are greatly influenced by subjective impressions and other factors irrelevant for an objective appraisal of the child's academic achievement. Nevertheless, the present writer considered classroom grades important and valuable information. First, a classroom grade constitutes tangible evidence to the child and his parents of his academic achievement and therefore, functions both as a criterion as well as motivator for his subsequent efforts in school. Secondly, the fact that children transferred to as many as eighty different schools in which teachers had no knowledge of the time the child entered school made the information on classroom performance an unbiased, conservative, and therefore potentially valuable measure in our study.

Cognitive Style

A third and final measure of intellectual functioning was based on Kagan's test for Matching Familiar Figures designed to assess reflective and impulsive cognitive styles (Kagan, J., 1965). This test was administered during the fourth grade to eighty-five percent of the original sample of our children.

Measures of Socio-Emotional Functioning

As in the case of intellectual functioning, we attempted to obtain a wide range of motivational and socio-emotional measures in order to assess the impact of early educational intervention in this area. Some of these measures were based on the child's functioning in the test situation, some dealt with the child's reaction to other people in the educational situation, others dealt with the child's attitudes and emotional reactions to academic pursuit and his own perceived level of success and failure in this area. Some of the measures were obtained during the first year after the child entered school, others from four to six years later when the child had accumulated a good deal of experience in the educational situation. In spite of the wide range of content, method, and time of data collection, our measures of the child's motivational and socio-emotional functioning were all meaningfully related to each other because they all shared a common reference point, namely the child's reaction to the educational process and to his perceived role in the classroom as a pupil, a peer, and an individual in his own right.

The child's reaction to his social and physical environment within the classroom was assessed through systematic ratings of the child's dependency on adults, his aggression against others, his autonomous achievement motivation in his interaction with his physical environment, and his conflict in turning to others for help, support, and affection. These measures were obtained through repeated ratings of children by two independent observers in the nursery, kindergarten, and first grade. Each measure involved rating on a seven point scale. The measures of dependency on adults involved ratings on the frequency and intensity of the child's requests for help, recognition, proximity, and contact with his teachers or other adults in the classroom. A child's aggression was measured in terms of the frequency with which he exhibited threats, derogation, physical attack against people and destruction of materials in the classroom. Autonomous achievement striving was measured in terms of the frequency with which a child initiated activities, tried to overcome obstacles, tried to complete activities by himself and derived satisfaction from work in terms of manifest tension reduction following his achievement effort. The measures of dependency conflict or mistrust consisted of four specific scales: inhibition, indirectness, inconsistency within time as well as overtime in the expression of requests for help, attention, and affection from adults. Details, reports of the construction and validation of these measures have been reported elsewhere (see Beller, 1959, 1961, and 1972).

The child's attitude toward learning and toward school as well as his success in his academic effort and in relating to his peers were assessed through ratings by his teachers during the first and second grade. The child's motivational and emotional reactions to individual testing carried out by the research team each year were assessed through a series of seven point scales constructed by the present writer for this purpose. The scales covered the following dimensions: cooperative to resistant, involved to uninvolved, low to high persistence, rigid to flexible, and relaxed to tense. These scales were applied by the examiner following each individual testing period from nursery through the third grade. Only data collected during testing from first to third grade were analyzed.

The additional measures in the socio-emotional realm dealt with the maturity of the child's moral judgment and the child's self-concept. Both of these measures were obtained at the end of the fourth grade on eighty-five percent of the original sample. The measures of moral judgment consisted of eighteen stories adapted from Piaget's assessment procedure for moral realism (Seltzer, A. R. and Beller, E. K., 1969). The measure of the child's self-concept was based on the Piers-Harris Test (Piers, E. V. and Harris, D. B., 1964), a self-administered eighty item questionnaire.

Evaluation

The outcome of the overall analysis in which children entering school at different times were compared on the three standardized intelligence tests are presented in Table 2 and Figures 1-3. One major finding was that our three groups did not differ from each other on their intellectual functioning when they entered school at four, five, and six years of age. For both the Stanford-Binet and the Draw-A-Man tests on which comparisons were possible and tested by one way analysis of variance, the differences between the three groups were not only statistically insignificant, but also below three points and within the standard error of measurement. This finding has two important implications. First, it demonstrates that our three groups of children were not biased with regard to their initial level of intellectual performance when they entered school. This is particularly important since these groups were not assigned randomly at the outset of the study. Secondly, it can be seen that the absolute level of the child's intellectual functioning when he starts school varies as a function of which intelligence tests one uses. On the Draw-A-Man Test, these children function initially only slightly below the average for the standardization group, that is, between average IQ scores of ninety-seven and ninety-eight. On the Stanford-Binet, the average IQ scores of the children from the three groups ranged from ninety to ninety-two, that is, at the lower end of the normal range when compared to the standardization group. On the Peabody Picture Vocabulary Test, the initial level of intellectual functioning was considerably more depressed than on the other two tests since it ranged from the average IQ scores of eighty-one to eighty-two for the kindergarten and first grade groups when they entered school. Thus, depending on the type of test used for generalization one might say that the initial level of intellectual functioning of these children ranged from slightly below average to considerably below average. The implication of this finding clearly is that any generalization concerning the intellectual functioning of disadvantaged children must be qualified depending on the test used to determine such a level. In our particular case, the two tests yielding the largest differences are the Draw-A-Man test which is based purely on performance and yields a high score compared to the Peabody Picture Vocabulary Test which is a verbal comprehension test involving no expressive performance items and yielding the most depressed score. The Stanford-Binet test, which is based on a comprehensive battery of both verbal and performance items yields an intermediate level of functioning which falls approximately between the two extreme levels yielded by the other two tests.

A second major finding which can be seen from the data presented in Table 2 and Figures 1 and 3 deals with differences in the initial exposure of a child to formal education. It can be seen from inspection of Table 2 and Figure 1 that although there was no difference between a child's absolute level of intellectual functioning when he entered school, the initial exposure resulted in a much larger increase in the level of his intellectual functioning when the child entered school earlier rather than later. The increase was over six points (92.1 to 98.6) from nursery to kindergarten, dropping to an increase of over three points (92.2 to 94.4) for the children entering kindergarten to their performance in the first grade, and turning to a decrease in the children who entered school at first grade (from 89.9 to 88.6). These changes were found to differ significantly from one another when tested by an analysis of variance for repeated measures (F = 10.98, df = 2/159. $p < .01$). The conclusion from these findings is that the boost in the level of intellectual functioning resulting from a child's initial exposure to formal education is greater the earlier the child starts school.

When we consider next the prolonged impact of educational intervention from the time the child entered school until the end of the fourth grade, it becomes evident that this will vary markedly as a function of the test employed or the dimension of intellectual functioning measured. On the Stanford-Binet test, it is evident from inspection of Table 2 and Figure 1 that after the initial boost, the level of intellectual functioning remains remarkably stable from year to year.

TABLE 2

MEAN SCORES ON THREE MEASURES OF INTELLIGENCE (STANFORD-BINET TEST, GOODENOUGH DRAW-A-MAN TEST, AND THE PEABODY PICTURE VOCABULARY TEST) FOR THREE GROUPS OF CHILDREN (GROUP I HAD NURSERY AND KINDERGARTEN, GROUP II HAD KINDERGARTEN ONLY, AND GROUP III HAD NEITHER NURSERY NOR KINDERGARTEN) ON SIX GRADE LEVELS

	GRADE TESTED											
TIME OF ENTRANCE	N	NURSERY	N	KINDER-GARTEN	N	FIRST GRADE	N	SECOND GRADE	N	THIRD GRADE	N	FOURTH GRADE
						Stanford-Binet						
Nursery	(57)	92.1	(56)	98.6	(53)	98.4	(52)	97.8	(51)	97.6	(50)	98.4
Kindergarten			(53)	91.2	(53)	94.4	(50)	92.8	(46)	93.1	(46)	91.7
First Grade					(57)	89.9	(55)	88.6	(53)	89.3	(53)	88.6
						Peabody Picture Vocabulary						
Nursery*			(51)	84.8	(47)	89.5	(52)	88.6	(49)	90.3	(50)	91.8
Kindergarten			(52)	80.7	(53)	85.4	(50)	88.9	(46)	89.1	(46)	88.1
First Grade					(57)	82.4	(55)	84.1	(53)	84.8	(52)	84.9
						Draw-A-Man						
Nursery	(56)	97.6	(55)	96.2	(51)	99.6	(52)	94.9	(50)	93.7	(50)	94.3
Kindergarten			(53)	96.8	(53)	98.6	(50)	96.6	(46)	91.7	(46)	91.6
First Grade					(57)	98.3	(55)	92.2	(53)	87.2	(53)	85.6

*Peabody Picture Vocabulary Test was not given on the nursery level.

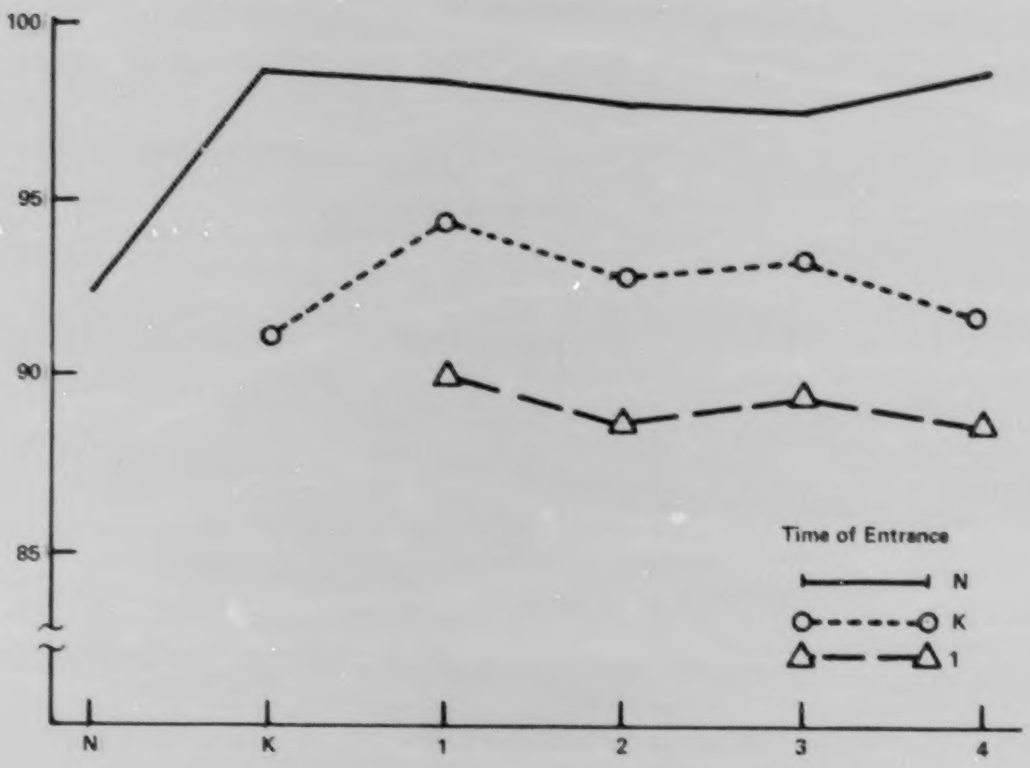

Figure 1.—Average Stanford-Binet IQ Scores across grades of groups entering school at Nursery (N), Kindergarten (K) and First Grade (1)
(Sizes of groups ranged from N-46 to N-58)

Similarly, the difference between the three groups remains stable with the nursery children maintaining their advantage and the first grade children performing consistently lower than the children who entered school before first grade. The difference between the three groups from first to fourth grade was statistically significant when tested by an analysis of variance for repeated measures ($F = 6.71$, $df = 2/429$, $p < .01$). It should be emphasized at this point that testing of all children was blind and the team of testors changed from year to year. The remarkable stability of the test and its sensitivity to early educational intervention must also be emphasized. Although all children started school with the same depressed average intellectual level of functioning those children who experienced the earliest educational intervention reached an approximately average level of intelligence on this widely used and well standardized test of intellectual functioning.

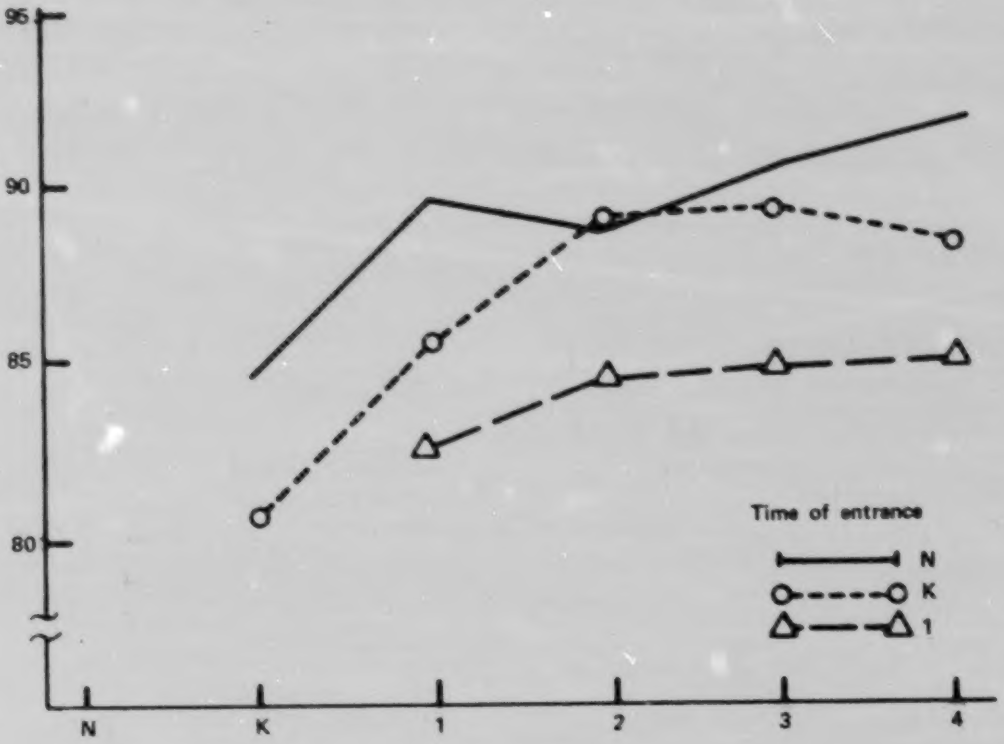

Figure 2.—Average Peabody IQ Scores across grades of groups entering school at Nursery (N), Kindergarten (K) and First Grade (1)
(Sizes of groups ranged from N-46 to N-58)

An analysis of variance carried out on Peabody Picture Vocabulary IQ scores of children from the first to fourth grade yielded similar results as those obtained from analysis of Standord-Binet IQ scores. Again, we find that after the initial rise from kindergarten to first grade, the children settled down to a fairly stable level of intellectual functioning from first to fourth grade. Although the differences between the three groups were less marked than those on the Stanford-Binet, the differences were in the same direction and statistically significant when tested by an analysis of variance for repeated measures ($F = 3.40$, $df = 2/414$, $p. < .05$). It is important to point out at this point that the Peabody Picture Vocabulary Test which was more economical in terms of time for administration as well as in the amount of training necessary for an examiner to administer the test yielded essentially similar findings as those based on the Standord-Binet and correlated between .60 and .70 with Stanford-Binet IQ scores. However, as will be seen later in this chapter, the Stanford-Binet test yielded much more stable findings, was more sensitive to the impact of early educational intervention and apparently less affected by cultural factors than the Peabody Picture Vocabulary Test.

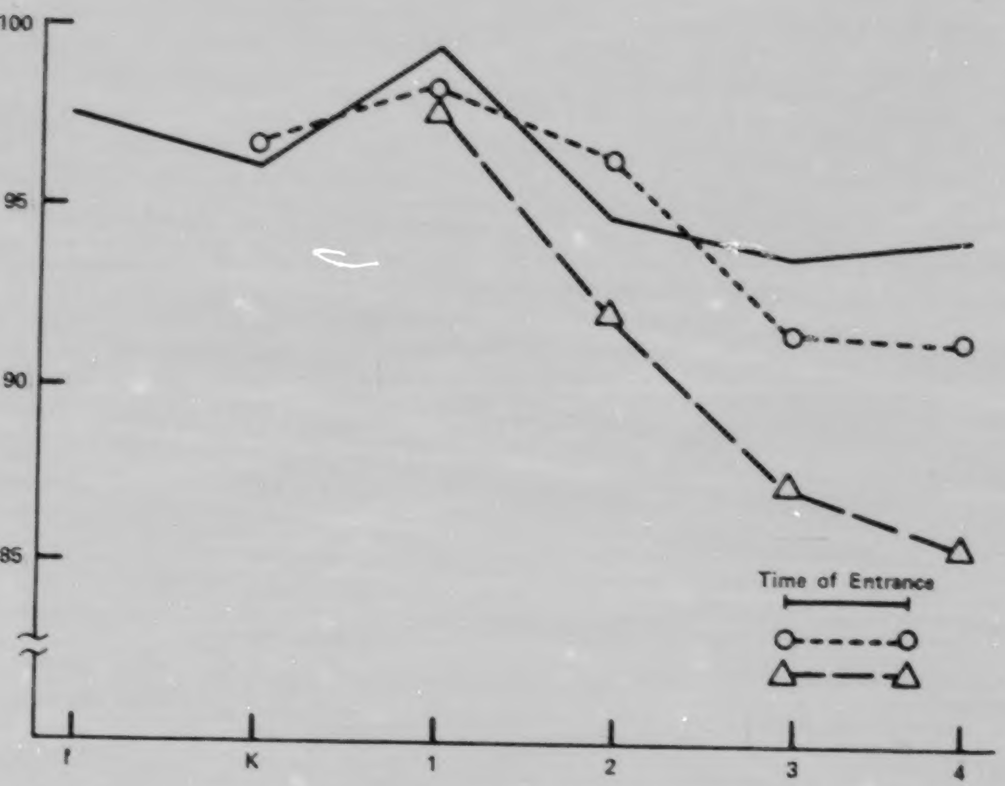

Figure 3.— Average 'Draw-A-Man' IQ Scores across grades of groups entering school at Nursery (N), Kindergarten (K) and First Grade (1)
(Sizes of groups ranged from N-46 to N-58)

When we turn to the findings obtained from the Goodenough Draw-A-Man test, it can be seen from inspection of Table 2 and Figure 3 that the outcome differed from the findings obtained on the first two tests. Although the three entrance groups differed by the first grade on the Stanford-Binet and Peabody Picture Vocabulary Test scores (in the order of better performance the earlier the educational intervention started), the three groups did not differ in the first grade on the Goodenough Draw-A-Man IQ scores. In contrast to the stability of performance over time on the Stanford-Binet and Peabody Picture Vocabulary, we find a steady overall decline in Goodenough IQ scores from first to fourth grade. This overall decline was statistically significant when tested by analysis of variance ($F = 26.50$, $df = 2/426$, $p < .01$). Moreover, as can be seen from Table 2 and Figure 3 the decline was proportional to the timing of school entry. IQ declined more steeply from first to fourth grade the later the child entered school. As can be seen from Table 3, the correlation between grade and IQ became increasingly more negative the later the child entered school. Thus, the correlation of the decline of IQ with increasing age was small and insignificant for the children entering school at nursery, larger and significant ($p < .05$) for the children entering school at kindergarten, and largest and most significant ($p < .01$) for the children who entered school at first grade. Finally, when the declines in the three groups were compared, the difference between declines in Group I and Group III were found to be statistically significant ($t = 1.93$), ($df=419$, $p. < .05$). Insofar as the drawing of a person can be taken as a reflection of a child's perception of people and of his self-image, these findings would suggest that a later start in school and continued negative educational experiences in a child's life will result in a decline of his performance on this particular task. Such a conclusion seems to be supported by the fact that this decline is differential and largest in the group of children who start school latest and continually perform more poorly on intellectual tasks than the other two groups.

TABLE 3

DECLINE IN DAM IQ OVER GRADES 1 THROUGH 4 IN THREE GROUPS OF CHILDREN (GROUP I = ENTERING NURSERY, GROUP II = ENTERING KINDERGARTEN, GROUP III = ENTERING FIRST GRADE)

Entering Group	N[a]	r[b]	p
I	203	−.12	NS
II	195	−.17	≤ .05
III	218	−.30	≤ .01

a. *N* is the number of IQ scores in a group, pooled across first through fourth grade testing.

b. r is the correlation between grade level (first through fourth) and IQ.

It is clear from the foregoing that the employment of multiple criteria is extremely valuable in the evaluation of immediately prolonged effects of early educational intervention, especially in disadvantaged children. The use of single criteria may easily lead to erroneous or inadequate conclusions with regard to the absolute level of intellectual functioning of disadvantaged children. The use of single criteria may also lead to inconsistent findings with regard to prolonged effect of early educational intervention over time. In the present study, we have seen that the Stanford-Binet Test was particularly sensitive to initial beneficial effects of educational intervention in the nursery and in the kindergarten. In sharp contrast, the Goodenough Draw-A-Man test revealed an equally marked but a considerably delayed effect of early educational intervention.

Finally, the findings presented so far for the Stanford-Binet and Peabody Picture Vocabulary Tests are in general agreement with findings reported by two other major intervention studies (Gray, S., and Klaus, R. A., 1970, and Weikart, D., 1971). As discussed elsewhere (Beller, 1972), all three studies show an initial positive effect due to early educational intervention. The initial rise is more dramatic but less sustained over time in the other two studies when compared to our own findings. This difference is understandable in the light of a lower initial level of intellectual functioning of children in the other two studies, as well as differences in the salience of early intervention, e.g., a summer program in Gray's study, and rural setting of the other studies versus a large metropolitan environment as the setting for the present study. However, considering the basic objectives of all three studies, the similarities are more impressive than the differences.

Academic Achievement

Before we turn to findings in this area, it should be reiterated that children were distributed over as many as eighty different classrooms by the fourth grade.

The report of our analysis of academic achievement will be limited to five major subjects: arithmetic, reading, spelling, science, and social studies. Marks were available for arithmetic and reading from the first to the fourth grade and for spelling, science, and social studies from the second to the fourth grade. Findings were analyzed separately for boys and for girls since consistent differences occurred between the two groups in comparisons between children who entered school earlier and later. The findings for the girls are presented in Table 4. As can be seen from inspection of Table 4, the findings are all in the predicted direction for each of the five subjects from grade one through grade four. An analysis of variance for repeated measures yielded significant differences between the three groups throughout all grades ($p < .05$, or $p < .01$) for reading, spelling, science, and social studies, while the difference approached significance ($p < .10$) for arithmetic. It is also evident from inspection of the data that although the differences between the three groups of girls decreased by the fourth grade, the order remained consistently in the predicted direction, that is, with girls who had entered school earlier ahead of girls who entered school later.

TABLE 4

AVERAGE MARKS FOR THREE GROUPS OF GIRLS (GROUP I = ENTERING NURSERY, GROUP II = ENTERING KINDERGARTEN, GROUP III = ENTERING FIRST GRADE) IN ARITHEMETIC, READING, SPELLING, SCIENCE, AND SOCIAL STUDIES FROM FIRST TO FOURTH GRADE

Time of Entrance Groups	N	Grades				
		1st	2nd	3rd	4th	Average
				Arithmetic		
I	(19)	54.96	53.62	55.13	50.87	53.64
II	(17)	53.12	51.20	51.29	50.45	51.52
III	(18)	47.72	46.99	48.21	47.93	47.93
				Reading		
I	(19)	55.66	55.13	54.82	51.78	54.35
II	(17)	53.49	51.02	52.14	49.57	51.55
III	(18)	48.98	44.75	44.23	47.44	46.35
				Spelling		
I	(17)		4.12	3.94	4.00	4.02
II	(16)		3.56	3.83	3.88	3.77
III	(17)		2.82	2.94	3.00	2.92
				Science		
I	(17)		3.65	3.53	3.41	3.53
II	(16)		3.31	3.19	2.94	3.14
III	(19)		2.65	3.24	2.94	2.94
				Social Studies		
I	(19)		3.76	3.35	3.59	3.57
II	(16)		3.38	3.31	3.25	3.31
III	(17)		2.88	3.12	3.00	3.00

The findings were much less consistent for boys than for girls. As can be seen from inspection of Table 5, the major difference between groups was the superiority in marks for children who had preschool as compared to children who had no preschool. Among the preschool boys, the kindergarten group was consistently ahead. The magnitude as well as order of difference varied from year to year much more than was the case for girls. The three entrance groups of boys differ significantly (p. <.05) on spelling and approached significance (p. <.10) on reading and social studies.

One might conclude from these findings that the effects of early educational intervention of disadvantaged girls appears to have been consistent and prolonged through the fourth grade. The findings for boys, although generally in the predicted direction are less marked and less consistent.

TABLE 5

AVERAGE MARKS FOR THREE GROUPS OF BOYS (GROUP I = ENTERING NURSERY, GROUP II = ENTERING KINDERGARTEN, GROUP III = ENTERING FIRST GRADE) IN ARITHMETIC, READING, SPELLING, SCIENCE, AND SOCIAL STUDIES FROM FIRST TO FOURTH GRADE

Time of Entrance Groups	N	Grades 1st	 2nd	 3rd	 4th	 Average
			Arithmetic			
I	(21)	54.28	52.67	51.74	48.64	51.83
II	(17)	56.49	56.20	54.43	48.87	53.75
III	(14)	46.90	51.86	48.77	48.64	49.04
			Reading			
I	(21)	49.88	52.78	51.27	47.43	50.34
II	(17)	54.16	55.22	54.79	51.90	54.02
III	(14)	45.04	49.67	50.43	46.49	47.91
			Spelling			
I	(21)		3.57	3.48	3.06	3.36
II	(19)		4.00	3.78	3.58	3.79
III	(13)		2.92	2.52	2.69	2.71
			Science			
I	(21)		3.43	3.24	3.14	3.27
II	(19)		3.74	3.58	3.63	3.65
III	(13)		3.08	3.23	3.08	3.13
			Social Studies			
I	(21)		3.52	3.24	3.33	3.36
II	(19)		3.79	3.58	3.47	3.61
III	(13)		3.15	3.00	2.77	2.97

Motivational and Socio-emotional Functioning of Children

In order to assess the impact of early educational intervention on motivation as well as on achievement, teachers in each classroom were asked to select two extreme groups of three children each who manifested best or worst attitudes toward study and learning, most positive versus most negative attitudes toward school, and who were most or least popular among other children. After the teachers had selected such groups who often contained children who had not been part of our study, we examined the groups to find whether children from our study were included in the two extreme groups. These data were collected only during the first two grades of elementary school and the outcome of the analysis is presented in Table 6. It can be seen that early educational intervention affected not only academic achievement but also the child's attitude toward learning and toward school. In both areas, the three groups differed significantly from each other with the children who entered school at nursery age being most frequently represented in groups characterized as having the best attitudes toward learning and school, and conversely least often represented in groups characterized by the worst or most negative attitude toward learning and school. Early educational intervention did not affect a child's popularity among other children, at least as perceived by the teacher. We shall see later that this item did differentiate between groups on a self-concept test given in the fourth grade.

TABLE 6

RATINGS OF PUPILS' ATTITUDES IN FIRST AND SECOND GRADE FOR THREE GROUPS OF CHILDREN (GROUP I = ENTERING NURSERY, GROUP II = ENTERING KINDERGARTEN, GROUP III = ENTERING FIRST GRADE)

ATTITUDES		GROUP	FREQUENCIES (Best)	(Worst)	CHI Square	DF	P
			In First Grade				
1.	best vs. worst attitude toward study and learning	I	9	2	9.07	2	< .05
		II	4	5			
		III	1	7			
2.	most positive vs. most negative attitude toward school	I	6	2	6.01	2	< .05
		II	6	2			
		III	3	8			
3.	most vs. least popular among other children	I	5	8	2.70	2	N.S.
		II	5	2			
			In Second Grade				
1.	best vs. worst attitude toward study and learning	I	17	4	8.88	2	< .05
		II	12	5			
		III	8	13			
2.	most positive vs. most negative attitude toward school	I	15	9	6.20	2	< .05
		II	13	4			
		III	6	11			
3.	most vs. least popular among other children	I	12	9	1.12	2	N.S.
		II	5	5			
		III	5	8			

In order to get a broader assessment of the child's reaction to the learning situation, we also obtained measures of such reaction in individual situations in which the research team carried out intelligence testing. The children's reactions in these situations are presented in Table 7. It can be seen that children with preschool experience, that is Groups I and II, were consistently more cooperative, more involved, more persistent in their effort, and more relaxed in the test situation than children who had neither nursery nor kindergarten experience. These differences were significant for cooperation, involvement, and persistence ($F = 6.25$, $df = 2/114$, $p<.01$; $F = 5.33$, $df = 2/114$, $p<.01$; $F = 3.42$, $df = 2/114$, $p<.05$ in that order). The differences between entrance groups on relaxed versus tense, although in the predicted direction, fell short of significance ($F = 2.26$, $df = 2/114$, $p<.15$). The measure of rigidity and flexibility apparently varied in a very complex way which does not lend itself to a simple generalization. In all, our findings show that earlier or belated educational

TABLE 7

RATINGS OF REACTIONS TO BEING TESTED ON INTELLIGENCE TESTS IN THREE GROUPS OF CHILDREN (GROUP I = ENTERING NURSERY, GROUP II = ENTERING KINDERGARTEN, GROUP III = ENTERING FIRST GRADE) FROM FIRST THROUGH THIRD GRADE

		Grades			
Entrance Groups	N	1st	2nd	3rd	Average
		(7) Cooperative to Resistant (1)			
I	(29)	5.5	5.6	5.2	5.4
II	(42)	5.5	5.5	5.5	5.5
III	(49)	5.1	4.4	4.4	4.6
		(7) Involved to Uninvolved (1)			
I	(29)	4.7	4.6	4.6	4.7
II	(42)	5.1	4.5	4.5	4.7
III	(49)	4.2	3.8	3.9	3.9
		(7) Persistant to Nonpersistant (1)			
I	(29)	3.8	4.2	3.9	4.0
II	(42)	4.2	4.0	4.4	4.1
III	(49)	3.4	3.3	3.5	3.4
		(7) Rigid to Flexible (1)			
I	(29)	4.2	4.0	4.3	4.2
II	(42)	4.2	3.6	3.7	3.8
III	(49)	4.2	4.3	4.8	4.1
		(7) Relaxed to Tense (1)			
I	(29)	4.1	4.7	4.0	4.3
II	(42)	4.2	4.5	4.2	4.3
III	(49)	3.7	3.9	3.8	3.8

intervention affected, significantly, not only academic achievement but also children's attitudes toward learning and school manifested in the classroom and their motivations to achieve and their emotional reactions to individual testing.

We shall now turn to our findings based on measures of dependency, aggression, autonomous achievement striving, and dependency conflict which were obtained in the classroom situation for children in the nursery, in kindergarten and in the first grade. Although the brief discussion which follows is not directly concerned with the issue of the impact of early intervention, it is introduced at this point to provide a better understanding of these motivational variables.

The interrelationships between motivational measures are presented in Table 8. Two sets of relationships presented in this table are of theoretical interest. Dependency and autonomous achievement striving were conceptualized and measured in such a way that they do not represent opposite ends of a bi-polar continuum. This means that on these measures a child can be both dependent and autonomous (or independent) although the balance between these two motivational factors within a child may have implications for conflict. As can be seen in Table 8, a modest negative relationship is found in the nursery children between dependency and autonomy but this relationship disappears completely in kindergarten and in first grade. Thus, in the present study, it should be kept in mind that dependency motivation and autonomous achievement striving or independence are not opposite ends of one continuum. The next relationship of theoretical concern is that between dependency motivation and dependency conflict. The distinction between dependency motivation and dependency conflict is useful in terms of measurement only if the two are uncorrelated. A high negative correlation between these two measures would mean that one would not know whether high dependency motivation means low conflict or whether high dependency conflict is actually equivalent to low dependency motivation. As can be seen in Table 8 in the present study the two measures are almost entirely unrelated, especially in kindergarten and first grade. Turning to substantive relationships we find that two correlations are consistently significant and persist on all age levels. Dependency motivation and aggression are positively correlated on all age levels although there is a small decline in the first grade. It seems that the child who seeks contact and attention from others expresses his need both in positive and negative (aggressive) ways. Moreover, excessive dependency demand and wishes are likely to result in frequent frustration which in turn may generate aggression. On the other hand, the aggressive child who cannot control his impulses is likely to be more helpless and elicit help from adults in his environment. It would also seem that the high aggressive child is somewhat handicapped in functioning independently or autonomously as evidenced by the consistently negative though low correlations between aggression and autonomous achievement striving. Finally, the aggressive child who has difficulty controlling his impulses becomes more conflicted and mistrustful in his relation to adults as evidenced by an increasing positive correlation between aggression and dependency conflict from nursery

TABLE 8

INTERCORRELATIONS BETWEEN MOTIVATIONAL MEASURES IN NURSERY, KINDERGARTEN AND FIRST GRADE#

Motivation	Nursery (N = 175)			Kindergarten (N = 93)			First Grade (N = 96)		
	1	2	3	1	2	3	1	2	3
1. Dependency									
2. AAS##	-.32**			-.03			-.03		
3. Aggression	.41**	-.38**		.56**	-.19		.33**	-.20	
4. Dependency Conflict	-.17*	-.34**	.08	-.09	-.50**	.25*	-.07	-.70**	.30**

#Estimates based on largest samples available for this analysis

##AAS = Autonomous Achievement Striving

*P ≤ .05

**P ≤ .01

to first grade. This same finding may also reflect that a conflicted relationship between child and adult fails to result in the curbing of aggression. Moreover, dependency conflict has an increasingly devastating effect on the child's ability to function autonomously. This is evidenced by any increasing negative correlation between dependency conflict and autonomous achievement striving from the nursery to the first grade.

We shall now turn to a consideration of the patterning of motivated behavior in the children of our three groups in the first grade. Before we discuss this pattern, it is important to anticipate the later finding, namely that dependency motivation and aggression have very little predictive value for later intellectual performance in these children while autonomous achievement striving and dependency conflict had high predictive power for the child's ongoing and later intellectual performance. Returning to patterns of motivational variables, one way analysis of variance was carried out to test differences between groups on each of the four motivational variables presented in Table 9. The three groups differed significantly on autonomous achievement striving ($F = 3.74$, $df = 2/93$, $p<.05$), and on aggression ($F = 4.59$, $df = 2/93$, $p<.05$). Differences between the groups approached significance ($F = 2.91$, $df - 2/93$, $p< .10$) for dependency motivation, and ($F = 2.62$, $df = 2/93$, $p < .10$) for dependency conflict. Looking at the columns in Table 9, it is clear that the children who have been in school longest, that is Group I, are elevated on all expressive measures, namely dependency, aggression, and autonomous achievement striving. Simultaneously the same children have the lowest score on dependency conflict or the lowest mistrust in their adult environment. In sharp contrast Group III which started school latest is depressed on all three motivational variables and is higher than any other group on dependency conflict or mistrust in the adult environment. Group II is high on autonomous achievement striving and takes an intermediate position between Groups I and III on trust in the adult environment. It is not difficult to understand the heightened autonomous achievement striving and greater trust in the adult environment of children who have had one or two years of preschool experience prior to entering first grade. However, the heightened dependency and aggression in the children who had both nursery and kindergarten experience may mean more than simply increased expressiveness and therefore needs to be examined more closely. The finding of increased dependency demands may mean that these children have developed a closer emotional bond with the teacher which represents a delayed development of what normally occurs earlier in most non-disadvantaged children in our society. This emotional tie provides the teacher with a greater opportunity to reach the child, to socialize him, and to influence him than is possible with the child who has not yet developed such an emotional tie. Thus, heightened dependency might be a positive sign that the child is now more amenable to socialization

TABLE 9

AVERAGE MOTIVATIONAL MEASURES FOR THREE GROUPS OF FIRST GRADE CHILDREN

(Group I had Nursery and Kindergarten,
Group II had Kindergarten, Group III
had First Grade only.)

Motivational Measures	Group I (N=31)	Group II (N=28)	Group III (N=37)
Dependency	4.30	3.56	3.72
AAS+	4.35	4.29	3.41
Aggression	4.54	3.56	3.44
Dependency Conflict	3.55	3.95	4.25

+ = Autonomous Achievement Striving (AAS) and to educational influence from the teacher, rather than a sign of fixation at an infantile level of functioning. The same inference can be made with regard to heightened aggression in children who have had nursery experience. Most of these children experience considerable frustration in their daily lives away from the classroom. Therefore, heightened aggression of these children in the classroom may mean that they are less inhibited in giving vent to their reactions to a very frustrating life outside the classroom. The positive meaning of this finding for the role of the school in shaping the child's future will be more fully appreciated after having reported one of the writer's most vivid impressions in preschools for deprived lower-class children.

After training teachers to rate children in the areas of dependency, autonomous achievement striving and aggression, the writer encountered considerable resistance from teachers who come from a similar background as their pupils when asked to report incidents of aggression. Time and again, the writer was confronted with the statement that these children did not manifest any aggression. Apparently, some of these teachers were reluctant to either perceive or to permit aggression in these lower-class, highly deprived children from backgrounds which generated considerable frustration and therefore at least the potential for aggression. The difficulty these teachers had in either perceiving or accepting aggression in their deprived preschool pupils may have greatly weakened their potential effectiveness as socializers of aggression. By denying or suppressing aggressive behavior in the nursery or kindergarten, the teacher removes the aggression from the classroom, but she also disqualifies herself as an effective agent in modifying the child's ability to cope with hostile and aggressive impulses away from the classroom.

On the basis of this experience, it may be said that the nursery children who manifested more aggression in the first grade were not necessarily less socialized than their peers who separated this area of behavior from the classroom and thereby removed it from the teacher's influence. The stable and intimate relationship which the child with a background of nursery school was able to experience and develop with his teacher had encouraged him to display a much wider range of all behaviors, even if they were undesirable, in the presence of this protective figure whom he had come to trust. In this sense, the heightened manifestations of emotional dependence on the teacher and of aggression represents a delayed, positive development in deprived children, which indicates that these children have become more amenable than their peers to the educational process and to socialization by the school. Together with higher autonomous achievement striving and lower dependency conflict, that is, inhibition in the expression of dependency, these changes represent greater self-confidence and increased trust in the human environment in those children who have had the benefit of nursery experience, compared to children who were not exposed to the educational process until they entered first grade.

Interrelationships Between Socio-emotional and Intellectual Areas of Functioning

In order to estimate the predictive power of the child's socio-emotional and functioning intellectual performance we correlated measures of dependency motivation, aggression, autonomous achievement striving and dependency conflict obtained in the first grade with performance on three intelligence tests and in five academic subjects from the first to the fourth grade.

As indicated earlier, dependency on teachers and aggression had very weak predictive power for the child's ongoing as well as prolonged intellectual functioning. As can be seen in Tables 10 and 11, dependency on teachers was entirely uncorrelated with intellectual performance and academic achievement in boys. Although dependency on teacher also failed to yield any correlations in girls with their performance on the three intelligence tests, this variable had some predictive power for academic achievement of girls (see Table 11). It is interesting to note that this effect on the girls' overall performance in the classroom was delayed to the fourth grade and otherwise was limited to arithmetic. With regard to the latter, it is possible that in this group of children the girls who accepted a dependent role had less problems in succeeding in arithmetic tasks. Two comments are indicated with regard to the relationship between dependency in the first grade and delayed overall success in academic achievement in the classroom in the fourth grade: first, early dependency of girls on the teacher in the first grade may have facilitated acceptance and internalization of the expectations of the educational situation which resulted eventually in greater and more successful efforts in academic achievement; second, the finding of this delayed effect highlights the importance of longitudinal research in studies of the impact of early educational intervention.

TABLE 10

PREDICTIVE CORRELATIONS OF MEASURES OF DEPENDENCY MOTIVATION OBTAINED IN FIRST GRADE WITH SCORES ON THREE TESTS OF INTELLECTUAL FUNCTIONING FROM Ist TO 4th GRADES FOR BOYS+ AND GIRLS+

	Grades			
Tests	1st	2nd	3rd	4th
	Boys			
Binet	-.14	-.03	.00	.15
DAM#	-.10	-.21	-.06	.08
PPVT#	-.23	-.04	.11	.25
	Girls			
Binet	.11	.31	.28	.28
DAM#	-.02	-.34*	-.01	.06
PPVT#	-.08	-.01	.19	.17

+For boys, N = 46 to 53
For girls, N = 38 to 43

#DAM = Draw-A-Man Test
PPVT = Peabody Picture Vocabulary Test

*p ≤ .05

TABLE 11

PREDICTIVE CORRELATIONS OF MEASURES OF DEPENDENCY MOTIVATION OBTAINED IN FIRST GRADE WITH ACADEMIC ACHIEVEMENT BASED ON MARKS IN FIVE SUBJECT AREAS FROM 1st TO 4th GRADE FOR BOYS+ AND GIRLS+

	Grades			
Subjects	1st	2nd	3rd	4th
	Boys			
Arithmetic	.13	-.02	-.04	-.20
Reading	-.16	.13	.00	-.05
Spelling		.12	.00	-.16
Science		.20	.08	-.09
Social Studies		.24	.04	-.06
	Girls			
Arithmetic	.24	.34*	.46**	.44**
Reading	.15	.26	.21	.13
Spelling		.29	.20	.36*
Science		.11	-.08	.44*
Social Studies		.24	-.01	.42*

+For boys, N = 34 to 50
For girls, N = 28 to 38

*p ≤ .05
**p ≤ .01

The relationships between aggression and intellectual functioning were also generally weak (see Tables 12 and 13). However, there were two exceptions. While aggression was unrelated to the performance of girls on the Stanford-Binet Test and the Peabody Picture Vocabulary Test it correlated consistently negatively with their performance on the Draw-A-Man test (see Table 12). This finding suggests that aggression in these girls may well have had a negative effect in their perception of people and of themselves. There is no relationship between aggression and performance on the three intelligence tests in boys. However, with regard to academic achievement, aggression seems to have just as delayed an effect in boys as dependency had in girls since aggression of boys in the first grade is negatively correlated with academic achievement in the fourth grade and not before that time (see Table 13). Thus, in boys, early aggression may interfere with internalization and later acceptance of the demands of the educational situation. Again, this finding underlies the importance of longitudinal research in impact studies.

TABLE 12

PREDICTIVE CORRELATIONS OF MEASURES OF AGGRESSION OBTAINED IN FIRST GRADE WITH SCORES ON THREE TESTS OF INTELLECTUAL FUNCTIONING FROM 1st TO 4th GRADE FOR BOYS⁺ AND GIRLS⁺

	Grades			
Tests	1st	2nd	3rd	4th
		Boys		
Binet	.08	.15	.03	.06
DAM#	.02	-.18	.06	.17
PPVT#	.21	.04	.10	.12
		Girls		
Binet	-.04	.03	-.06	-.07
DAM#	-.32*	-.44**	-.39*	-.32*
PPVT#	-.16	-.16	-.04	-.13

⁺For boys, N = 46 to 53
For girls, N = 38 to 43

#DAM = Draw-A-Man Test
PPVT = Peabody Picture Vocabulary Test

*$p \leq .05$

**$p \leq .01$

TABLE 13

PREDICTIVE CORRELATIONS OF MEASURES OF AGGRESSION OBTAINED IN FIRST GRADE WITH ACADEMIC ACHIEVEMENT BASED ON MARKS IN FIVE SUBJECT AREAS FROM 1st TO 4th GRADES FOR BOYS[+] AND GIRLS[+]

	Grades			
Subjects	**1st**	**2nd**	**3rd**	**4th**
		Boys		
Arithmetic	.18	-.06	-.16	-.46**
Reading	-.08	.12	.02	-.27
Spelling		-.02	-.04	-.18
Science		.02	.08	-.35*
Social Studies		.04	-.06	-.32
		Girls		
Arithmetic	-.07	.11	-.04	-.05
Reading	-.12	.01	-.14	-.09
Spelling		-.20	-.15	-.02
Science		-.24	-.12	-.10
Social Studies		-.17	-.21	-.06

[+] For boys, N = 34 to 50
For girls, N = 28 to 38

*$p \leq .05$
**$p \leq .01$

When we turn to autonomous achievement striving in the first grade, we find a strong consistent and pervasive relationship of this motivational variable with all measures of intellectual achievement from the first to the fourth grade in both girls and boys (see Tables 14 and 15). The predictive power of autonomous achievement striving is particularly consistent for boys to their performance on the three intelligence tests, especially the Stanford-Binet, and in all children to their academic success in the classroom from the first to the fourth grade. However, we encounter once more a somewhat delayed effect, and this time for girls to their performance on intelligence tests which emerges most strongly in the third and fourth grades.

TABLE 14

PREDICTIVE CORRELATIONS OF MEASURES OF AUTONOMOUS ACHIEVEMENT STRIVING OBTAINED IN FIRST GRADE WITH SCORES ON THREE TESTS OF INTELLECTUAL FUNCTIONING FROM 1st TO 4th GRADE FOR BOYS+ AND GIRLS+

	Grades			
Tests	**1st**	**2nd**	**3rd**	**4th**
		Boys		
Binet	.54**	.65**	.62**	.58**
DAM#	.43**	.52**	.34*	.30*
PPVT#	.39**	.41**	.37**	.45**
		Girls		
Binet	.29	.39*	.45**	.42**
DAM#	.30*	.31	.46**	.40**
PPVT#	.17	.24	.33*	.48**

+For boys, N = 46 to 53
For girls, N = 38 to 43

*p ≤ .05
**p ≤ .01

#DAM = Draw-A-Man Test
PPVT = Peabody Picture Vocabulary Test

TABLE 15

PREDICTIVE CORRELATIONS OF MEASURES OF AUTONOMOUS ACHIEVEMENT STRIVING OBTAINED IN FIRST GRADE WITH ACADEMIC ACHIEVEMENT BASED ON MARKS IN FIVE SUBJECT AREAS FROM 1st TO 4th GRADES FOR BOYS+ and GIRLS+

	Grades			
Subjects	**1st**	**2nd**	**3rd**	**4th**
		Boys		
Arithmetic	.66**	.73**	.78**	.57**
Reading	.59**	.70**	.75**	.57**
Spelling		.66**	.61**	.64**
Science		.68**	.33*	.70**
Social Studies		.68**	.51**	.51**
		Girls		
Arithmetic	.76**	.74**	.72**	.55**
Reading	.46**	.74**	.67**	.51**
Spelling		.73**	.78**	.60**
Science		.65**	.36*	.56**
Social Studies		.63**	.39*	.58**

+For boys, N = 34 to 50
For girls, N = 28 to 38

*p ≤ .05
**p ≤ .01

TABLE 16

PREDICTIVE CORRELATIONS OF MEASURES OF DEPENDENCY CONFLICT OBTAINED IN FIRST GRADE WITH SCORES ON THREE TESTS OF INTELLECTUAL FUNCTIONING FROM 1st TO 4th GRADES FOR BOYS$^+$ AND GIRLS$^+$

	Grades			
Tests	1st	2nd	3rd	4th
		Boys		
Binet	-.47**	-.54**	-.58**	-.59**
DAM#	-.37**	-.42**	-.27	-.23
PPVT#	-.35**	-.34*	-.38*	-.40**
		Girls		
Binet	-.32*	-.39*	-.20	-.23
DAM#	-.18	-.32*	-.12	-.18
PPVT#	-.11	-.07	-.16	-.28

$^+$For boys, N = 46 to 53
For girls, N = 38 to 43

#DAM = Draw-A-Man Test
PPVT = Peabody Picture Vocabulary Test

$^{*}p < .05$
$^{**}p < .01$

Dependency conflict in the first grade is also a powerful predictor for the child's ongoing and continued intellectual performance from the first to the fourth grade (see Tables 16 and 17). However, dependency conflict correlates negatively with intellectual performance and academic achievement. The correlations between dependency conflict or mistrust and performance on the three intelligence tests from the first to the fourth grade are much stronger and more consistent in boys than in girls. Generally, dependency conflict correlates more strongly with academic achievement than with performance on intelligence tests (see Tables 16 and 17). Although the negative correlation between dependency conflict and academic achievement are somewhat stronger for boys than for girls, they are significant and consistent over time with all academic subjects for both sexes. These findings leave little doubt that motivation and socio-emotional factors in the relationship between the child and his teachers have a profound and prolonged effect on the intellectual performance and academic achievement of disadvantaged children.

We shall now turn to one of the most important findings in the present study, namely, the interacting effect of one of the motivational variables with the impact of early educational intervention on the intellec-

TABLE 17

PREDICTIVE CORRELATIONS OF MEASURES OF DEPENDENCY CONFLICT OBTAINED IN FIRST GRADE WITH ACADEMIC ACHIEVEMENT BASED ON MARKS IN FIVE SUBJECT AREAS FROM 1st TO 4th GRADES FOR BOYS+ AND GIRLS+

	Grades			
Subjects	**1st**	**2nd**	**3rd**	**4th**
		Boys		
Arithmetic	-.52**	-.57**	-.60**	-.41**
Reading	-.46**	-.56**	-.56**	-.47**
Spelling		-.48**	-.47**	-.46**
Science		-.56**	-.32*	-.55*
Social Studies		-.54**	-.48**	-.43*
		Girls		
Arithmetic	-.36*	-.38*	-.42**	-.22
Reading	-.27	-.46**	-.47**	-.38*
Spelling		-.46**	-.34*	-.33*
Science		-.49**	-.40*	-.37*
Social Studies		-.54**	-.42**	-.40*

+For boys, N = 34 to 50
For girls, N = 28 to 38

*$p \leq .05$
**$p \leq .01$

tual functioning of the child. Children were divided above and below median on autonomous achievement striving in the first grade. Comparisons were then carried out separately between the three entrance groups among the high and low autonomous children. The outcome of these comparisons are presented in Figures 4 and 5. It is clear from these figures that early educational intervention has a quite different effect on the disadvantaged child depending on whether he is high or low on autonomous achievement striving. Children who were high on autonomous achievement striving in the first grade showed no differential effect in their performance from the first to the fourth grade on either the Stanford-Binet or the Peabody Picture Vocabulary Test. In other words, high autonomous achievement children who did not start school until kindergarten or first grade continued to perform as well as those who had the nursery experience both on the Stanford-Binet and on the Peabody Picture Vocabulary Test. A radically different picture emerged for children who were low on autonomous achievement striving at the outset. The low autonomous child was greatly handicapped in his intellectual functioning as a result of not having had the nursery experience and most handicapped when he had neither nursery nor kindergarten experience (see Figures 4 and 5). The difference between the three low autonomous entrance groups was statistically significant when tested by analysis of variance both on the Stanford-Binet ($F = 5.06$, $df = 2/44$, $p < .05$) and on the Peabody Picture Vocabulary Test ($F = 3.35$, $df = 2/44$, $p < .05$). Another finding which can be seen in Figures 4 and 5 is that the children who had the earliest

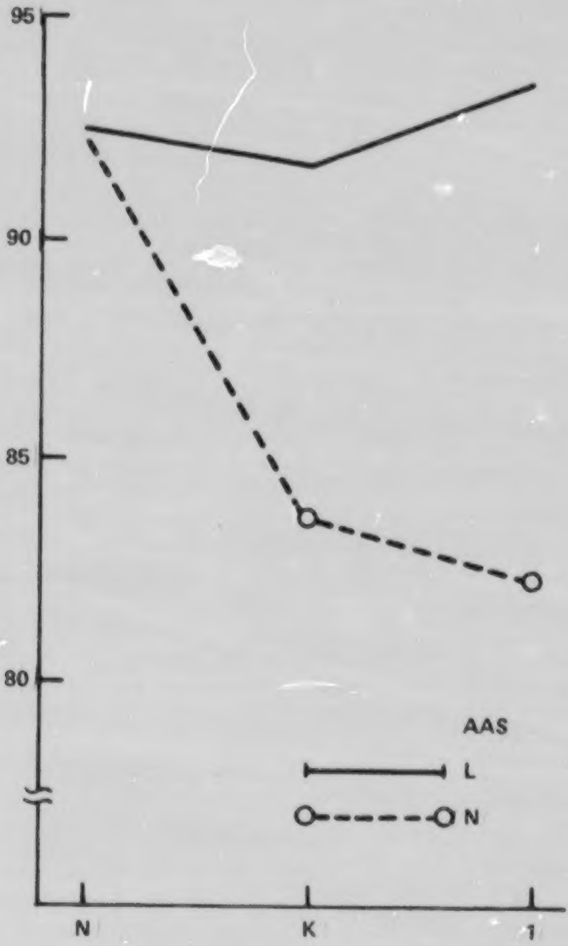

Figure 5.– Average Peabody IQ Scores of high (H) and low (L) autonomous achievement striving (AAS) groups entering school at nursery (N), Kindergarten (K) and First Grade (1) (Sizes of groups ranged from N-11 to N-20)

educational intervention, that is, children in the nursery group, were least affected by their motivational disadvantage since the difference between high and low autonomous children in their performance on the Stanford-Binet and Peabody Picture Vocabulary was both statistically insignificant and smaller than between any other pair of high and low autonomous entrance groups. In other words, early educational intervention protected these children from the detrimental effects of a motivational handicap which is clearly visible in their peers who did not have the nursery experience.[1] It is important to note that this interacting effect of motivation and timing of educational intervention was not found for academic achievement in the classroom. In other words, academic achievement in the classroom of both high and low autonomous children was equally affected by the timing of early educational intervention. Since intelligence tests probably constitute a more enduring measure of intellectual ability than daily performance in the classroom, this interacting effect of a child's motivation and early educational intervention on later intellectual functioning deserves serious consideration.

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[1] Parenthetically, this effect is not accounted for by the relationship between autonomous achievement and intelligence since a similar breakdown between high and low IQ children yielded significant differences between entrance groups both in the high and low IQ children.

The impact of early educational intervention on several additional areas of socio-emotional functioning was investigated at the end of the fourth grade. One of the areas assessed was impulse control. Kagan's test for Matching Familiar Figures was used to classify children as reflective or impulsive. As can be seen from Table 18, this test discriminated between entrance groups of boys. Boys with nursery or kindergarten experience had significantly more reflectives than boys who entered school at the first grade. Conversely, boys who entered at the first grade had significantly more implusives than boys with preschool experience. The test did not discriminate between entrance groups of girls. Thus, one may conclude that preschool intervention facilitates reflective attitude toward problem-solving in disadvantaged boys and that this effect persists to the end of the fourth grade.

TABLE 18

DISTRIBUTIONS OF REFLECTIVES AND IMPULSIVES IN THREE GROUPS OF CHILDREN

(Group I had Nursery and Kindergarten; Group II had Kindergarten; Group III entered First Grade)

Entrance Groups	Boys Reflectives	Boys Impulsives	Girls Reflectives	Girls Impulsives
I	15	6	5	9
II	14	6	8	3
III	4	13	7	13
	$x^2 = 10.92$ df = 2 $p \leq .01$		$x^2 = 4.71$ df = 2 $p \leq .10$	

+ = Based on Kagan's test for Matching Familiar Figures

A second area of social functioning assessed in the fourth grade was the maturity of the child's moral judgment. The test employed to assess this area consisted of eighteen stories which had been originally constructed by Piaget and later modified to measure moral realism in children (Seltzer, A., and Beller, E. K., 1969). An analysis of these data by means of Wilcox's matched-pairs signed rank test revealed that boys with preschool experience manifested significantly greater maturity of moral judgment than boys who entered school at first grade ($p < .05$). The test did not discriminate significantly between entrance groups of girls. Thus, early educational intervention results in eventual greater maturity of moral judgment in boys while no such effect is found in girls.

The third area of socio-emotional functioning dealt with self-concept and was assessed by means of the Piers-Harris Test. The following procedure was used to analyze the responses of children to the eighty different items in the test. Items were selected for comparison between entrance groups on the basis of yielding a difference of 10 percent or more between any two of the three entrance groups of girls. Items which did not meet this criterion were not used for comparisons between the entrance groups. Comparisons were carried out separately for girls and for boys. The findings for girls are presented in Tables 19A, B, and C. Inspection of the items in Table 19A on which the nursery girls who had most preschool experience responded to most frequently, yielded a clear, unambiguous profile of a positive self-concept. This is particularly true for the first nineteen items. The last four items on which these children scored high indicate some apprehensiveness particularly in relation to academic achievement and performance. These four items, however, cannot be said to reflect a negative self-concept. When one moves on to examine the items on which the girls who entered school at kindergarten age responded most frequently a quite different profile emerges. As can be seen in Table 19B, there is a sharp contrast and contradiction between the first fourteen items and the last five items. One gets the impression from this profile that these girls have a very insecure basis for their positive self-concept. When we turn to Table 19C which lists the items on which girls

TABLE 19A

HIGH PERCENTAGE RESPONSES OF NURSERY GIRLS TO SELF-CONCEPT ITEMS

Questions	Groups		
	Nursery (N = 22)	Kindergarten (N = 20)	First Grade (N = 29)
I am cheerful (52)	91	85	72
I am not clumsy (64)	91	80	72
In games and sports, I play instead of watch (65)	77	65	52
When I try to make something, everything does not seem to go wrong (61)	77	55	59
It is not usually my fault when something goes wrong (13)	73	50	59
I do not lose my temper easily (68)	59	40	45
I do not think bad thoughts (78)	100	85	72
I am well behaved in school (12)	95	80	76
I do not behave badly at home (25)	86	85	69
I often volunteer in school (42)	100	95	76
I do not usually want my own way (39)	77	65	55
I am not unpopular (11)	82	65	66
I am popular with boys (57)	41	30	14
I have many friends (51)	100	90	90
It is not hard for me to make friends (3)	91	70	72
I do not pick on my brothers and sisters (32)	91	75	59
I am an important member of my family (17)	73	45	69
My family is not disappointed in me (59)	91	80	83
When I grow up, I will be an important person (9)	95	85	76
I am shy (6)	59	55	41
I am nervous (28)	50	30	28
I get nervous when my teacher calls on me (7)	45	30	31
I get worried when we have tests (10)	73	45	59

Grouping based on year entering school.

( ) Original item numbers indicating position in the test.

who entered school latest responded most frequently, a strikingly different profile emerges than that of the girls who had preschool experience. These girls seem to have an overwhelmingly negative self-concept. Thus, the timing of educational intervention seems to have as marked an effect on the self-concept of the disadvantaged girls as on any other area of their functioning. These pervasive differences appear to reflect the effect of cumulative positive academic experiences in the girls with early educational intervention while the girls who had a belated start without the benefit of preschool experience appeared to have had cumulative negative academic experiences (see Table 4). One need also keep in mind that until most recently, success in the educational field has been a realistic prospect only for the lower class black girl while her male counterpart had very little if any reason to look for success in the area of learning or academic professions. If this reasoning is accurate, as the present writer believes it to be, the very different effect of early educational intervention of the boys in the present study becomes more meaningful and more easily understandable.

TABLE 19B

HIGH PERCENTAGE RESPONSES OF KINDERGARTEN GIRLS TO SELF-CONCEPT ITEMS

Questions	Groups		
	Kindergarten (N = 20)	Nursery (N = 22)	First Grade (N = 29)
I am smart (5)	85	73	72
I am not always dropping and breaking things (75)	80	73	55
I am good in making things with my hands (19)	85	68	66
I am a good reader (70)	90	77	79
I can give a good report in front of the class (30)	90	73	76
I have a pleasant face (43)	70	55	62
I am not unhappy (50)	85	73	72
I do not cry easily (76)	80	68	66
I do not worry a lot (37)	65	55	41
My friends like my ideas (33)	100	86	72
My classmates think I have good ideas (49)	90	50	66
I am a leader in games and sports (63)	60	27	38
I am not different from other people (77)	75	55	48
I do not wish I were different (60)	95	64	66
In school I am a dreamer (31)	45	32	17
I hate school (45)	20	9	10
I cannot draw well (23)	30	18	14
I am not an important member of my class (27)	60	50	50
I feel left out of things (40)	45	32	38

Grouping based on year entering school.

( ) Original item numbers indicating position in the test.

TABLE 19C

HIGH PERCENTAGE RESPONSES OF FIRST GRADE GIRLS TO SELF-CONCEPT ITEMS

Questions	Groups		
	First Grade (N = 29)	Nursery (N = 22)	Kindergarten (N = 20)
I cause trouble to my family (14)	24	9	10
I am always dropping or breaking things (75)	45	27	20
I am clumsy (64)	28	9	20
I am unlucky (36)	48	36	40
I am not strong (15)	69	55	40
I don't have lots of pep (55)	52	32	25
I worry a lot (37)	59	45	35
I am not cheerful (52)	28	5	15
I am not a happy person (2)	27	5	15
My looks bother me (8)	31	18	5
I am unpopular (11)	34	18	35
I am not popular with boys (57)	86	59	70
I am not popular with girls (69)	28	9	10
It is hard for me to make friends (3)	28	9	30
My friends don't like my ideas (33)	28	14	0
I am among the last to be chosen for a game (46)	59	41	40
People pick on me (58)	45	32	25
I get into a lot of fights (56)	33	14	25
I have bad thoughts (78)	28	0	15
I dislike my brother (72)	34	18	15
I pick on my brothers and sisters (32)	41	9	25
I behave badly at home (25)	31	14	15
My parents do not expect too much of me (38)	24	41	35
In games and sports I watch instead of play (65)	48	23	35
When I grow up I will not be an important person (9)	24	5	15
I do not volunteer in school (42)	24	0	5
In school I am a dreamer (31)	83	68	55
I am not shy (6)	41	39	55

Grouping based on year entering school.

( ) Original item numbers indicating position in the test.

When we turn to Table 20A, we find that boys who benefited from early educational intervention of both nursery and kindergarten present a more differentiated and realistic self-concept rather than the generalized positive self-concept we found in the nursery girls (see Table 19A). The first five items reflect a positive self-concept and acceptance of self, a preference for one's own group and its values such as music, and for an active participation in the group. The second five items (6-10) are negative but they occur much less frequently than the first five items. In fact, one gets the impression that some of the items in this second cluster are responded to more realistically by these boys than for example by the boys who had no preschool experiences and who almost completely deny some of these items as applying to themselves. One might say the opposite applies to the third cluster of five items, i.e., 11-15. These items represent superficial and stereotyped positive characteristics which are responded to with much greater reservation by the nursery boys than others who did not have the benefit of this early educational intervention. The same may be said with regard to the last five items of Table 20A. These items were also responded to with more hesitation by the nursery boys than by the other two groups who appeared to be quite unrealistic in their almost uncritical acceptance and claim to self-application of these items. Thus what emerges for the nursery boys is a differentiated reserve and more realistic self-concept than in the boys of the other two entrance groups.

TABLE 20A

HIGH PERCENTAGE RESPONSES OF NURSERY BOYS TO SELF-CONCEPT ITEMS

Questions	Groups		
	Nursery (N = 27)	Kindergarten (N = 23)	First Grade (N = 22)
I am cheerful (52)	81	74	73
I like being the way I am (18)	96	83	86
I am good in music (24)	85	74	68
I'd rather work in a group than alone (71)	67	57	55
In games, I'd rather play than watch (65)	78	61	50
I wish I were different (60)	44	26	23
I do many bad things (22)	33	22	14
I am not a leader in games and sports (63)	59	39	45
I often get into trouble (34)	52	39	32
I lose my temper easily (68)	56	35	32
I have pretty eyes (29)	37	69	59
I have a pleasant face (43)	44	78	64
I have nice hair (41)	52	91	59
I am good looking (54)	52	83	59
I am popular with girls (69)	37	57	59
When I grow up, I will be an important person (9)	81	91	91
I am good in my school work (21)	74	91	91
I can give a good report in front of the class (30)	74	83	82
My friends like my ideas (33)	70	83	77
I am a leader in games and sports (63)	41	61	55

Grouping based on year entering school.

( ) Original item numbers indicating position in the test.

When we turn to Table 20B we find that the boys who entered school at kindergarten like their female counterparts present a sharply contradictory self-image. The first eleven items are not only very positive but show uncritical acceptance of stereotyped characteristics such as having nice hair, a pleasant face, and being good looking. However, when we inspect responses to the last six items, we find that a strong dislike of school, a contradiction of the earlier "my friends like my ideas" by the later statement "my classmates don't think I have good ideas" and altogether a strong feeling of rejection which puts into question the acceptance of earlier statements by the same boys indicating acceptance by peers and family. It almost seems that these boys have had enough of a head start to aspire to success but lack the emotional basis for supporting such aspirations.

TABLE 20B

HIGH PERCENTAGE RESPONSES OF KINDERGARTEN BOYS TO SELF-CONCEPT ITEMS

Questions	Groups		
	Kindergarten (N = 23)	Nursery (N = 27)	First Grade (N = 22)
I am smart (5)	87	70	77
I am strong (15)	83	70	59
I have nice hair (41)	91	52	59
I have a pleasant face (43)	78	44	64
I am good looking (54)	83	52	59
I am a good reader (70)	91	74	73
My friends like my ideas (33)	83	70	77
I am not disobedient at home (35)	83	74	73
I am not slow in finishing my school work (26)	78	67	55
It is usually not my fault when something goes wrong (13)	83	59	64
I am not always dropping or breaking things (75)	83	67	68
I hate school (45)	26	15	18
In school I am a dreamer (31)	48	30	27
My classmates don't think I have good ideas (49)	48	37	27
My family is disappointed in me (59)	26	15	14
I am not popular with boys (57)	39	26	23
I feel left out of things (40)	43	33	36

Grouping based on year entering school.

( ) Original item numbers indicating position in the test.

Finally, Table 20C which deals with statements responded to most oftenly by boys who did not have the benefit of any preschool experience reveals a more passive self-concept in which denial and defensiveness play a major role. For example, the first ten items give the impression of an attitude "everything will be all right, don't worry." This is particularly true of items such as "I am a good person;" "I don't think bad thoughts;" "I sleep well at night;" "I do not want my own way;" and "I'm not different from other people."

These are not positive assertive self-characteristics. This impression is further supported by the acceptance of such negative items as "I am unlucky;" "I worry a lot;" "I am not strong;" "In games and sports, I watch instead of play." This profile is certainly not as devastatingly negative as the profile of the girl counterpart who also did not have the benefit of any preschool education. Thus, one might conclude while early educational intervention has a simpler, more permeating effect on the self-concept of the lower class disadvantaged girl, the benefit of preschool education is more complex but not less marked in its effects on disadvantaged lower class boys.

TABLE 20C

HIGH PERCENTAGE RESPONSES OF FIRST GRADE BOYS TO SELF-CONCEPT ITEMS

Questions	Groups		
	First Grade (N = 22)	Nursery (N = 27)	Kindergarten (N = 23)
I am a good person (80)	95	81	83
I don't think bad thoughts (78)	86	74	74
I don't do many bad things (22)	86	67	78
I sleep well at night (44)	91	78	74
I usually do not want my own way (39)	82	37	61
I am not clumsy (64)	86	78	74
I am not dumb about most things (53)	91	78	87
I am not different from other people (77)	77	48	44
I don't wish I were different (60)	77	56	74
I am an important member of my class (27)	59	48	44
I am unlucky (36)	41	33	39
I worry a lot (37)	59	44	43
I am not strong (15)	41	30	17
I am not good in music (24)	32	15	26
I am slow in finishing my school work (26)	45	37	22
I get worried when we have tests (10)	59	48	48
I dislike my brother (72)	23	11	13
I pick on my brothers and sisters (32)	45	19	17
In games and sports, I watch instead of play (65)	50	22	39

Grouping based on year entering school.

( ) Original item numbers indicating position in the test.

SUMMARY AND CONCLUSIONS

The present study investigated immediate and prolonged effects of early educational intervention on a broad spectrum of socio-emotional and intellectual functioning in disadvantaged children. The study focused particularly on the interplay of socio-emotional and intellectual factors in the educational process in order to throw light on such questions as: who benefits from early educational intervention and why do some children benefit more than others?

We examined children who entered school at four, five, and six years of age. We did not attempt to find out why some children entered school earlier and others later. We did, however, take pains to match the different groups on relevant variables such as age, sex, social class, and ethnic identity. We also accomplished almost total equality between the three entrance groups on the level of their intellectual competence as measured by different tests when they entered the educational programs. Thus, we do feel that our entrance groups were well matched on relevant and important variables at the onset of educational intervention. More importantly, because of our concern for the question of who benefits from early educational intervention, we concentrated as much on comparisons between children within entrance groups as on comparisons between entrance groups. We found a good deal of evidence for both immediate, delayed, and prolonged effects of early educational intervention. We also found a series of factors such as a child's sex, motivational level and trust in the teacher which affected both the impact of the timing of educational intervention or when a child started school, and how much he benefited regardless of whether he started at four, five, or six years of age. Notwithstanding, the importance of our first set of findings, namely, that the timing of educational intervention in early childhood had immediate and prolonged effects on a wide range of the child's socio-emotional and intellectual functioning, our second set of findings, namely, the interplay of motivational, socio-emotional and intellectual processes helped us understand the former, and provided specific and useful information for future educational planning.

The timing of intervention had a direct effect on the patterning of those motivational and socio-emotional variables which proved to be essential in the socialization of orientations toward intellectual competence and academic achievement. One of these motivational variables, namely, level of autonomous achievement striving, while itself affected by early educational intervention acted also as an important indicator of which children suffered most and which least from the lack of preschool experience. Finally, the child's sex was an important monitor of the impact of early educational intervention. Timing of early intervention had a more marked, consistent and uniform effect on girls than boys in their academic achievement and self-concept. For girls, dependency on teachers had a positive effect on the socialization of academic achievement while aggression had the opposite effect in this regard on boys. Preschool experience had a direct and consistent effect only on boys in reflective-impulsive reactions to intellectual tasks and maturity of moral judgments. Early mistrust of teachers affected boys more consistently than girls in their readiness to benefit from educational experiences.

These findings suggest strongly that it might be more fruitful to channel future research to find answers to the question: which children benefit more than others from early educational intervention than to such questions as: Is preschool education necessary? or Does preschool education help disadvantaged children?

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CHAPTER 3.

A BRIEF SYNOPSIS OF AN INITIAL ENRICHMENT PROGRAM IN EARLY CHILDHOOD

Martin Deutsch, Elizabeth Taleporos, and Jack Victor

INTRODUCTION

The IDS program was established in 1958, and represented an attempt to study the interplay of environment on psychological development, and to evolve and develop an enriched and stimulating school curriculum for socially disadvantaged children. Over the years, the IDS program has evolved into a comprehensive five year enrichment curriculum, running from the prekindergarten year through the third grade.

The bulk of the program has operated within the regular public schools in several low-income areas in New York City; primarily, the classroom enrichment aspects of the program have been located in various public schools in East and Central Harlem, and for the first few years in lower Manhattan.

The areas that the program operated in, such as Harlem, are too diverse to describe simply or to characterize as one unit. In general, the families involved in this program live in conditions of economic deprivation; in crowded and unsafe housing; in an area characterized by high drug addiction rates, high crime rates, low employment rates, and inadequate health facilities.

The community in which the Institute operated was marked by a heightened awareness of political, social, and educational issues that were related to the educational welfare of children. Furthermore, in the time period covered by this paper, the Harlem community was one of the focal points for the development of the "Black Liberation Movement." Particularly in the late 1960's, the people in the Harlem community began to demand increased control over their own institutions and destinies. To cite just one relevant example, one of the schools in which the Institute's classes was housed was part of a demonstration district that was set up as an experiment in community control.[1]

Naturally, the Institute's program has been influenced by a number of factors which relate to changes within the host elementary schools and within the communities in which the program operated. Over the years, there has been a slow, but progressively positive, growth of the relationship between the Institute staff and personnel in the host schools, as well as between the Institute and people in the community that the program served.

When the program first began, many people in the Harlem community, for example, reached to the IDS program with suspicion and a certain amount of hostility. This can be partly attributable to their view of the Institute's program as "just one more short-lived program that experimented with black children."

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[1] The degree of control actually accorded to the communities in these experiments is, however, equivocal; the degree to which they have affected the quality of education has not been clearly established. For further discussion, see Wilson, 1969.

Initially, teachers in the schools also regarded this program with hostility and suspicion. For them, this seemed to have been a result of the fact that, at first, the Institute (for experimental purposes) tried to operate in isolation from the rest of the school, discouraging communication which would result in the diffusion of experimental curricula to non-experimental classrooms (and the contamination of control groups). The reaction has been subsequently modified, as the Institute's program became more established and as the interactions between Institute and non-Institute staff increased. As will be discussed below, a conscious effort was made later to extend the impact of the Institute's program to involve those in non-Institute classes.[2]

The United Federation of Teachers' strikes of 1967 and 1968 have also had an impact on the Institute's program and on the communities in which it operated. The strikes resulted in, among other things, a great deal of administrative confusion within the individual schools. Tension developed between the communities and the schools, as well as among the staff members of individual schools. Institute teachers, and many of their colleagues in inner city schools, did not support the strikes. Despite this fact, the tensions and confusion associated with them (both in the schools and the communities) affected the children in, and the operation of, the IDS program.

Curriculum

The enrichment program was originally delineated so as to focus on four general areas: language development; concept formation; perceptual and overall cognitive development; and self-concept.

Emphasis has been placed on a variety of techniques and approaches to early learning, including: (1) designing the physical arrangement of the classroom to provide a comprehensible and effective learning environment for the child; (2) providing self-pacing activities and promoting children's competence as independent learners through the use of a variety of specially designed auto-instructional games and equipment; (3) individualizing instruction by tailoring the level of task difficulty for each child and by arranging small instructional groups; (4) promoting expressive language behavior through the child's interaction with his teachers, classmates, and classroom environment; (5) maintaining the continuity of instruction by presenting the same kinds of tasks in a variety of situations and activities (e.g., introducing the concept of size differences by using different sizes of jars in painting, different sizes of blocks, and a variety of learning games that stress size discrimination).

A number of techniques and special materials were developed and used in order to help accomplish IDS goals. These teaching methods and materials are designed to help children master basic academic skills, assist youngsters in becoming independent learners, and help them approach problems and learning situations with confidence and with a feeling of competency. Only a few examples from among the many materials and techniques that have been developed and used by IDS (particularly in the preschool portion of the program) will be described here.

Materials were constructed for the *Language Master* instrument to build vocabulary and the understanding of basic concepts. Here, a taped voice identified an object or concept, which is represented by a picture on a card; as the card (with the strip of tape attached) moves through the machine, the pictured object or concept is exposed as the taped voice states its name. The child then identifies the object and, finally, records his own voice saying its name. He can them compare his designation and its pronunciation with that of the taped voice.

One of the games which has been developed at IDS is *Language Lotto.*[3] This game is similar to standard games of Lotto, but is used in a way so that it is appropriate for the children at varying linguistic and conceptual levels.

Each game in the Language Lotto series has three possible response levels. The first level is that of simple non-verbal matching: The child merely indicates by raising his hand that he has matched the card to a picture on his board. The second level can be described as a receptive-language stage, in that the caller describes the card, but doesn't show it to the players and the child must match the card to the picture on his board without the aid of visual cues, using only the caller's verbal description. The third level is a descriptive language stage: The caller takes a card from the completed board and the player has to describe the picture that is left exposed on the board.

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[2] These efforts were undertaken despite the fact that they would result in diffusion. The Institute's concern of necessity, was primarily with service to the schools and communities in which it operated and only secondarily with the strictness of an experimental design.

[3] The Language Lotto series was developed at the Institute for Developmental Studies by the late Dr. Lassar Gotkin. One series of such games is now commerically available from Appleton-Century-Crofts.

Each of the separate games in the Language Lotto series deals with a different level of language ability and with a different type of concept or relationship. For example, the first game involves the recognition of simple objects, many of which are commonly found around the classroom. The second game deals both with prepositions and with positional concepts (e.g., matching pictures and cards of a man under a chair, next to a chair, on a chair, etc.). Other games involve the use of verbs (action cards); conjunctions (the boy *and* the girl); singular and plural (boy, boys); etc. The most advanced game in the series involves the abstraction of particular relationships (e.g., matching a hand with a glove that fits on it).

Another example of Institute-developed learning materials is the *Letter Form Board*. This is a puzzle-like device that introduces the young child to the alphabet initially as a sensori-motor experience and involves him in concrete manipulation of the material. As with *Language Lotto*, the *Letter Form Board* can be used in many different ways, on several intellectual levels, and for a variety of cognitive tasks.

In addition to special equipment and materials, teaching strategies, such as the scheduling of a *Quiet Work Time* within the preschool day, were devised by IDS staff to meet enrichment program goals. During this time all noise producing activities are suspended, and children work with such materials as puzzles, individual learning games, etc. Teachers are able to work on a one-to-one or small group basis with children during Quiet Work Time, and to guide their learning activities.

In 1970 the IDS program expanded into the grades, as grade 1 reached the 1st grade level. While the grades portion (1st, 2nd, and 3rd grades) of the IDS program have been less developed, the strategies and philosophical orientation of the preschool program were carried through. Separate but related curricula were developed for language, mathematics and science, and creative dramatics. The Institute used many of the published curricula in these areas (such as the Stern and Sullivan reading programs and the AAAS science materials), as well as a plethora of Institute-developed learning games and materials. Emphasis was placed on the process of inquiry as well as on skill mastery, with special attention given to children's problem-solving abilities and their facility in handling new learning situations, while reinforcing curiosity and self-expression.

Evaluation

The academic progress of both Institute and control children involved in the longitudinal program has been monitored over the five-year period by administering both standardized and Institute-developed tests and observational procedures. IDS experimental children and their control groups were tested with a wide battery of measures of ability and achievement. Longitudinal evaluative information was obtained through the administration of the Stanford-Binet Intelligence Scale (Form L-M); the Peabody Picture Vocabulary Test; the Illinois Test of Psycholinguistic Abilities (with two samples, one administered to a single sample of experimental and control children over a period of time, and one administered cross-sectionally to several subsamples, at the same grade level); The Lorge-Thorndike Intelligence Tests (in the grades) and the Metropolitan Achievement Tests (in the grades).

For the most part, trained IDS testers administered the various instruments (with the exception of the MATS which were administered by the classroom-teacher). As qualified black testers were very few in number at that time, the Institute testers were predominantly white, and of middle class backgrounds. The following is a summary of which tests were administered, and at what testing periods they were given.

In addition to data obtained from the administration of the wide variety of quantitative measures of ability and achievement, more informal qualitative evaluations were obtained; these included responses from parents, teachers, principals, and siblings, as well as a sequence of anecdotal records concerning the progress of children in the program. Judging from both the quantitative and qualitative data available, one can say that, as individuals and as a group, the children in the IDS program benefited on many levels from their enrichment experiences.

Quantitative Evaluation

For the quantitative section of this evaluation, the performance of children in the first four waves (each year a new group, or wave, of children enrolled in the pre-kindergarten classes of the IDS program, and appropriate control groups were constituted) was examined.

The scores of experimental and control group children matched variously for length of exposure to a school program and for motivational factors were compared.[4]

The following table is a summary of those measures and those testing periods where significant differences were obtained by applying Analysis of Variance technique to the performance on scores for four waves of children. Experimental children scored significantly higher than their controls on the following measures:

TESTS	TESTING PERIODS
Stanford-Binet Intelligence Scale (Form L-M)	post-pre-kindergarten post-kindergarten
Peabody Picture Vocabulary Test	post-pre-kindergarten post-third grade post-third grade
The Lorge-Thorndike Intelligence Tests Level 1 - Nonverbal Battery	1st grade 2nd grade
Reading Prognosis Test	end of kindergarten (only period given)
Metropolitan Achievement Tests Reading Subtest (Word Knowledge Score)	2nd grade (greater only than the cC1 group) 3rd grade (greater only than the C_1 group)
Metropolitan Achievement Tests Reading Subtest (Reading Score)	2nd grade (greater only than the C1 group) 3rd grade
Metropolitan Achievement Tests Arithmetic Subtest (Problem Solving and Concepts Score)	3rd grade (greater only than C_1 group)
Early Childhood Inventories Body parts naming inventory Related concepts inventory-premathematics Related concepts inventory-prescience Set matching Shape naming	All given at the end of kindergarten
Illinois Test of Psycholinguistic Abilities 1961 Version	1st, 2nd and 3rd

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[4] Many more children and their families volunteered for the experimental program than could be accommodated by it. From the original group of volunteers, children were randomly assigned to an experimental and a "self-selected control" group (the Css group). This Css control group started school in the regular public school kindergarten classes. Similarly, a Ck control group was formed, composed of children who started school in the regular public school kindergarten classes, but who had not volunteered for the program. A C_1 group was also formed consisting of children who began school at the first grade in a regular public school.

Visual Decoding—calls for the ability to match objects that are conceptually similar	grades combined
Auditory Vocal Association—calls for the ability to associate objects that are functionally related	
Auditory Vocal Automatic—calls for ability to handle grammatical forms	
Motor Encoding and Vocal Encoding—both these subtests tap the ability to express oneself	
Illinois Test of Psycholinguistic Abilities 1968 Version	
Visual Reception—calls for ability to match conceptually similar objects	1st, 2nd and 3rd grades combined
Auditory Association—calls for ability to handle analogies	
Sound Blending—calls for the ability to pronounce a word when supplied with phonemic elements	

One of the first apparent trends in the evaluation data concerns the relationship of the results of the preschool program to those of the grades program. This trend, which is a temporal one, is directly related to the history of the enrichment program, and to the pattern of funding made available to it. While it was possible to put a great deal of systematic input in the preschool program (pre-kindergarten and kindergarten), the erratic and inconsistent nature of the funding available to the program as it expanded into the grades did not allow for a repetition and continuity of input on the necessary sustained basis.

The results of the preschool program are readily apparent, simply from an examination of the mean scores and *F*s obtained in the Analyses of Variance for such measures as the Stanford-Binet, and the Peabody Vocabulary Test (see Tables 1, 2, and 3). In terms of the stated goals of the program, children improved in their performance on those tests that were designed to tap general cognitive and language skills.

The results of the quantitative measures administered to children in the IDS grades program must, however, be viewed somewhat more tentatively. The marked difference between experimental and control children is not as uniformly present as it was in the preschool years. While the children did not experience any serious setbacks, and mostly performed at or near grade level on achievement tests, and at or near national norm on intelligence tests, the dramatic gains of the preschool years were not repeated in the grades; however, experimental children remained significantly more advanced with respect to their age peers in the same schools.

Another theme that we would like to discuss here is related to the evaluation design itself, and to the validity of the measures employed. In reviewing these data, there seems to be considerable question about the appropriateness of a strict experimental design (of Experimental vs. Control) in this field experiment, and also about the validity of measures that were not adequately standardized on this type of population.

The measures used in this evaluation were chosen for a number of reasons: first, for their merits as some of

EVALUATION SCHEDULE – FIRST FOUR WAVES

Group	Time of Testing					
	Pre-prekindergarten	Post-prekindergarten (or Beginning of Prekindergarten)	Post-kindergarten (or Pre-First Grade)	Post-First Grade	Post-Second Grade	Post-Third Grade
E Group	S–B PPVT	S–B PPVT	S–B PPVT RPT	L–T	L–T MATS (Reading Subtests)	S–B PPVT MATS (Reading & Arithmetic Subtests)
Css group	S–B PPVT	S–B PPVT	S–B PPVT RPT	L–T	L–T MATS (Reading Subtests)	S–B PPVT MATS (Reading & Arithmetic Subtests)
Ck group		S–B PPVT	S–B PPVT RPT	L–T	L–T MATS (Reading Subtests)	S–B PPVT MATS (Reading & Arithmetic Subtests)
C^1 group	--		S–B PPVT RPT	L–T	L–T MATS (Reading Subtests)	S–B PPVT MATS (Reading & Arithmetic Subtests)

Legend:

S–B	Stanford-Binet Intelligence Scale (Form L–M)
PPVT	Peabody Picture Vocabulary Test
RPT	Reading Prognosis Test
L–T	The Lorge-Thorndike Intelligence Tests Level 1 - Nonverbal Battery
MATS	Metropolitan Achievement Tests

the best measures available for longitudinal evaluation; and also for their practicality in terms of time administration and financial resources available for administration. While we have reservations about these instruments, they were the best available at the time, and were the most appropriate ones to use in order to obtain baseline data and longitudinal evaluative information.[5] On certain measures, for example, the standardization procedures leave much to be desired, especially when they are to be used with a black urban population such as the present one. (The Peabody Picture Vocabulary Test, for example, was standardized largely on a white southern sample in and around Nashville.)

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[5] Deutsch et. al. Guidelines for testing minority group children. *Journal of Social Issues.* XX, 129, 145.

TABLE 1

MEAN STANFORD-BINET SCORES AT EACH ADMINISTRATION

Pre-prekindergarten

	E			Css		
Wave	N	$\overline{X}$	S.D.	N	$\overline{X}$	S.D.
1	31	96.19	11.62	15	95.53	14.89
2	70	93.07	11.27	34	92.94	12.57
3	88	91.63	11.53	48	90.31	14.54
4	86	91.28	12.63	32	89.25	12.73
Total	275	92.40	11.86	129	91.35	13.64

Post-prekindergarten

	E			Css			Ck		
Wave	N	$\overline{X}$	S.D.	N	$\overline{X}$	S.D.	N	$\overline{X}$	S.D.
1	62	100.19	12.33	40	91.90	14.50			
2	62	98.89	9.69	45	91.29	12.52	58	88.19	12.44
3	67	100.76	10.76	34	92.76	11.41	66	92.91	10.73
4	69	96.96	12.02	23	92.70	9.71	56	90.00	14.71
Total	260	99.17	11.30	142	92.04	12.35	180	90.48	12.71

Post-kindergarten

	E			Css			Ck			C_1	
Wave	N	$\overline{X}$	S.D.	N	$\overline{X}$	S.D.	N	$\overline{X}$	S.D.	N	$\overline{X}$
1	43	103.58	14.02	29	92.07	14.65	26	92.23	13.55	30	85.53
2	39	94.72	12.75	26	94.54	13.77	37	90.73	13.40	74	80.82
3	55	101.91	12.39	23	90.52	19.72	61	94.84	13.45	47	87.64
4	52	99.85	13.94	20	95.20	11.65	53	91.19	12.19	32	84.69
Total	189	100.24	13.54	98	93.00	15.13	177	92.50	13.09	183	84.02

Third Grade

	E			Css			Ck			C_1	
Wave	N	$\overline{X}$	S.D.	N	$\overline{X}$	S.D.	N	$\overline{X}$	S.D.	N	$\overline{X}$
1	32	97.63	12.78	12	93.92	11.62	13	94.00	11.90	17	94.29
2	21	91.76	14.92	13	91.23	13.26	19	86.32	10.87	26	84.81
3	29	99.28	12.31	12	93.58	16.22	30	93.43	15.33	20	90.65
Total	82	96.71	13.38	37*	92.86	13.98	62	91.37	13.64	63	89.22

TABLE 2

MEAN PPVT IQ SCORES AT EACH ADMINISTRATION

Pre-prekindergarten

	E			Css		
Wave	N	$\overline{X}$	S.D.	N	$\overline{X}$	S.D.
1	32	75.16	16.08	16	70.44	18.13
2	69	68.73	16.24	32	67.72	17.95
3	87	66.87	14.02	50	62.64	13.73
4	84	66.81	13.86	30	64.93	13.56
Total	275	67.55	14.97	128	65.46	15.48

Post-prekindergarten

	E			Css			Ck		
Wave	N	$\overline{X}$	S.D.	N	$\overline{X}$	S.D.	N	$\overline{X}$	S.D.
1	62	85.85	17.95	40	75.25	17.95	39	76.08	17.
2	63	81.46	18.91	47	71.77	20.57	57	69.09	20.
3	69	81.41	17.55	35	68.51	16.69	70	75.06	17.
4	71	78.45	20.22	23	74.52	16.74	56	71.55	19.
Total	265	81.67	18.80	145	72.38	18.38	222	72.13	19.

Post-kindergarten

	E			Css			Ck			C_1	
Wave	N	$\overline{X}$	S.D.	N	$\overline{X}$	S.D.	N	$\overline{X}$	S.D.	N	$\overline{X}$
1	43	90.35	15.67	33	83.36	18.16	34	87.38	14.75	30	77.77
2	38	88.66	17.05	26	84.15	17.56	38	78.82	20.49	73	73.37
3	55	87.25	13.83	25	74.84	22.34	62	82.89	17.27	47	76.62
4	52	87.19	16.85	20	80.50	14.26	53	76.47	17.08	31	68.06
Total	188	87.76	15.72	104	80.96	18.55	187	81.06	17.80	181	74.03

Third Grade

	E			Css			Ck			C_1	
Wave	N	$\overline{X}$	S.D.	N	$\overline{X}$	S.D.	N	$\overline{X}$	S.D.	N	$\overline{X}$
1	31	90.39	12.88	12	86.25	17.71	13	86.15	10.55	17	84.71
2	21	90.95	12.68	13	84.15	14.55	21	89.19	14.37	25	83.28
3	30	96.40	14.40	13	84.92	9.39	30	94.07	17.72	22	87.91
Total	82	92.73	13.56	38	85.08	13.83	64	90.86	15.55	64	85.25

TABLE 3
SUMMARY OF ANALYSES OF VARIANCE

Testing Period	Stanford-Binet IQ Scores
Pre-prekindergarten	F ratio for Wave=2.99 (p .03) F ratio for Subject Group=1 (non-significant)
Post-prekindergarten	F ratio for Wave=.51 (non-significant) F ratio for Subject Group=31.82 (p .0001)
Post-kindergarten	F ratio for Wave=2.02 (non-significant) F ratio for Subject Group=31.52 (p .0001)
Post Third Grade	F ratio for Wave=5.15 (p .007) F ratio for Subject Group=2.31 (non-significant)

Testing Period	Peabody Picture Vocabulary Test
Pre-prekindergarten	F ratio for Wave=4.17 (p .007) F ratio for Subject Group=2.87 (non-significant)
Post-prekindergarten	F ratio for Wave=2.04 (non-significant) F ratio for Subject Group=14.83 (p .0001)
Post-kindergarten	F ratio for Wave=3.59 (p .02) F ratio for Subject Group=16.33 (p .0001)
Post Third Grade	F ratio for Wave=1.75 (non-significant) F ratio for Subject Group=3.36 (p .02)

In regard to the reservations about the use of these instruments, a preliminary examination of data from the Metropolitan Achievement Tests (Reading subtest) were correlated with scores on Gates-McGinnitie Reading Tests. The correlation obtained by relating scores from a sample of IDS experimental and control children on the Metropolitan Reading Tests and the Gates-McGinnitie Vocabulary subtest were relatively low: for 50 experimental and 49 control children, the correlations were .32 and .49 respectively. For other samples (of 19 experimental and 28 control children each), the correlations between the Gates-McGinnitie Comprehension subtest and the Metropolitan Reading Tests were only .57 and .25 respectively. One should note that these correlations represented only exploratory attempts to examine the relationship between these tests and employed samples with small n's. However, the data suggest that the two tests are not measuring the same thing with this population, and there is a strong possibility that if an instrument other than the Metropolitan had been used to measure reading, the results would have been quite different, and our analysis of the effects of the IDS grades program would have been cast in an entirely different light.

As we have noted, there were many problems and limitations in our attempts to assess the children adequately by means of the published standardized tests.

The early Childhood Inventories at the Institute[6] did, however, provide information that seemed to relate more specifically to the IDS curriculum elements, and to tap many of the skills generally considered to be important for young children to have.

While the groups (experimental and control) were not pretested on the Inventories prior to educational intervention (with the exception of the sixth wave Es), there is indirect evidence (from pretest equality on other measures) of probable equality among groups. Of the five subtests on which significant differences were found, three measured conceptual skills: two relational concepts subtests and the categorization subtest. Results on the labeling tasks tended to be less marked with scores that indicate that the E group knew Body Parts and Shapes better than the Ck group; however, differences on other naming tasks (Alphabet letters and Numerals) did not reach statistical significance. In addition, on a task requiring the child to abstract out concepts of quantity (despite changes in figural characteristics between standard and comparison pictures), the Quantity Matching Inventory, scores did not significantly differentiate the groups.

It should be noted that, although the skills measured by these inventories were skills taught in the IDS program, they were also taught in most cognitively oriented preschool programs. Furthermore, it should be noted that the IDS teachers were not aware of the content or nature of the Inventories; the content was not designed to resemble closely the IDS curriculum materials (insuring that the effects were not simply due to practice and familiarity with specific materials).

As one further comment on this quantitative evaluation, it is important to be aware that some events occurred in the operation of the enrichment program that acted to "contaminate" the control groups, and that made them misrepresentative for comparison purposes: the scores of control group children were atypically high, and the lack of statistical significance in some of the analyses in the grades may simply have an artifact of the unusual performance of the control children. This is particularly apparent in some of the Metropolitan Achievement Tests where, though no significant differences were found between experimental and control groups, children in the experimental group achieved at or near their grade level. Scores of children in this inner-city area typically fall far below grade level. In fact, when the scores of the experimental groups were compared to the average of the mean scores for schools where IDS operated its experimental classes, significant differences were found, often at the $p < .001$ level.

One must examine and speculate as to the nature of a host of extra-school variables that were operative in raising the control children's scores, and which may have had considerable influence on any of the scores considered in the data analysis. The influence of such socio-political factors as "urban renewal," and the acceleration of social change, especially in regard to race awareness and more positive self-image, is virtually non-measurable and one can only estimate that these factors must have had considerable influence, even if their extent has not been determined or systematically examined.

In addition, it is apparent that some of the experimental curriculum diffused to non-experimental classrooms in the schools, via such avenues as informal communication among teachers and communication to the teachers from the principal about elements of the program that seemed successful. Again, the extent of such diffusion factors cannot be measured, nor can their influence on the final quantitative evaluation of the program be readily determined.

Qualitative Evaluation

In addition to quantitative data, the Institute has gathered information of a qualitative nature pulled from anecdotal records, open-ended interviews, unsolicited letters written to the Institute, questionnaires, conversations with parents at the 3rd grade graduation ceremonies, observers' records, etc. These qualitative evaluations will be summarized below. Because of limitations of space, only a few of a large assortment of possible examples have been randomly selected for presentation.

An index of attitudes of school administrators toward the IDS program was obtained by interviewing four principals and five assistant principals. These interviews (conducted in the 1967-1968 school year) consisted of open-ended, unstructured discussions with the Early Childhood Coordinator for the district; the administrators were interviewed one at a time. All of the people interviewed expressed extremely favorable reactions regarding the program, stressing primarily the strength of the IDS materials and personnel.

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[6] These Inventories were developed at the Institute by Jack Victor and Allan Coller. They are currently available from the IDS dissemination services.

The Institute's own supervisors have been asked to write summaries of their impressions of the IDS program, outlining the major successes and failures, as well as making suggestions for future change. The majority of these supervisors wrote a balanced summary: they emphasized the success of such underlying approaches as the individualization of instruction in the IDS classroom; they stressed certain weaknesses they found in the program such as the failure of the in-service training program to adequately assist the entire school.

In the 1967-1968 school year, group interviews were held by the research staff with teachers, assistant teachers, substitute teachers, and all other teaching personnel who have been involved with the IDS classroom program. Again, an interesting response heterogeneity was obtained. Teachers stressed the success of the IDS program in terms of changing children's behavior (e.g., the children seemed better able to work in an independent fashion). The teachers responded negatively to the fact that the materials had changed from year to year and they felt that the guidelines provided for the implementation of these new materials were inadequate.

This will, of course, always be a problem in implementing pilot programs whose very nature is to experiment with new approaches and to be continually changing. Moreover, this problem is exacerbated by the teachers training experiences which generally tends to lock them into established methods; indeed one should really train teachers to demand change and innovation rather than be threatened by them.

Of all the groups whose qualitative reactions are reported here, parents and older siblings have given the most positive response. Older siblings have proudly brought their friends to observe their younger brothers working in the IDS classroom (viewing the classroom from behind a two-way mirror). Parents have repeatedly sent positive letters to the Institute about the program and about their children's performance in it. Information from parents was also obtained from interviews and informal conversations with the Community Aides. In general, those parents whose children entered the program at pre-kindergarten have noted changes in the child's level of socialization; in his ability to recognize things around him (e.g., pictures of animals, signs, etc.); and in his ability to use language. Parents have noticed differences in their children such as changes in their basic attitudes toward school and in their desire to achieve in school; parents also noted a difference in the rate and quality of learning that takes place in the IDS classroom as opposed to regular classrooms. The quotes offered here are just a very few examples of the contents of letters from parents and their comments about the Institute:

The Institute helps the children get a better understanding of why school is really important.

They learn more things and faster.

It were as though he learned very fast and it is very good.

Letters from parents have also included reference to their own involvement with the IDS program and activities at the Parent Center. They noted that they had received help in such matters as housing, clothing, etc. Parents reported that the activities of the Parent Center seemed to help them feel more confident in talking with their children and being involved with their school experiences:

> Because of the lesson plants at the Center and the instructions given by the Institute, I am able to converse with my children. Before this I was very much embarrassed when my children would ask me questions and I could not answer them. After entering the Center's program, I can now talk with them and don't feel embarrassed. I now have confidence in myself and feel secure.

Reports from teachers who have received IDS children into their classes (such as 4th grade teachers or those whose classes IDS children entered when they moved) consistently emphasized the fact that the Institute children were easily identifiable: not only by their overall "verbosity," but by their command of the language and their ease with using language to express their ideas. These teachers reported that IDS children were genuinely interested and excited about learning, wanted to be successful in school, that they were more independent than other children and did not shy away from new situations.

Visitors to the Institute classrooms have consistently remarked on the independence shown by IDS children. In fact, this aspect of children's behavior is currently an area of research at the Institute, which is primarily directed toward the assessment of classroom behavioral correlates of independence. Various instruments have been developed to assess children's independent behavior, some of which demonstrate very high reliability. Of crucial interest, is the relationship of these measures of independence to other behavioral traits, such as various personality characteristics and creativity (Schumer and Deutsch, 1971).

Recommendations for Future Work

Preparing guidelines for future work in this area, based on the decade of experience in research, in training, and in the classroom itself, is no simple straightforward task.

Many of the things that were learned as the enrichment program progressed were incorporated in it to help make it operate more effectively. Indeed, although we have outlined some general approaches and techniques, no single description of this curriculum could ever adequately reflect its nature, for it was designed to be continuously evolving, and at no point in time represented a monolithic entity, with each teacher mediating the purposes and approaches of the program in her own classes.

One of the most important recommendations that can be made for evaluation efforts is related to the development and utilization of more relevant measures, those that have been properly standardized and validated for use with this population. One should attempt to develop and use measures which have the intrinsic capacity to measure the child's responsiveness, and also to measure the ability of the system to respond to the child.

However, the problems of designing and evaluating the effects of an enrichment program go far beyond developing more valid measures, or devising experimental designs which take into consideration all the extra-school and uncontrolled variables which have influenced the children's behavior and development.

Enrichment programs operate within an entire social context, and often within a framework with many socio-political forces acting in an ambivalent manner thereby restricting program effectiveness. There is characteristically general social pressure for immediate gains on such measures as achievement or intelligence test performance, and for the evaluation of the success of a program on a ratio scale where one divides numbers of IQ points raised by dollars to get an index of success.

In the long run, only the children are short-changed by this state of affairs. Directors of enrichment programs are continually pressured into affirming that each element of their program reflects the most effective methods. Frequently children must settle for a program's first efforts, simply because the program is penalized for any "mistakes" by threats of cessation of continuing financial support.

Long term commitments are necessary so there can be an interplay of innovation, training, evaluative feedback and parental as well as community participation. It is necessary for participation and resources to come from all levels of the schools, universities as well as from the children and their communities. In addition, old experimental-control models are simply not adequate, and a special program should allow its influence to evolve and be conscientiously diffused in the entire school setting. As previously pointed out, considerable diffusion takes place anyhow; boundaries become artificial and irrelevant, reflecting statistical artifacts, not reality.

For further detailed information please consult the following reports:

Final Report: Project No. 5-0342
Grant No. OE-5-10-045

"An Evaluation of the Effectiveness of an Enriched Curriculum in Overcoming the Consequences of Environmental Deprivation," Dr. Martin Deutsch, Dr. Jack Victor, Elizabeth Taleporos, Dr. Cynthia Deutsch, Bataan Faigao, Edith Calhoun, and Dr. Edward Ponder.

Final Report: Grant No. OEO-2425

"Regional Research and Resource Center in Early Childhood," June 1, 1971, U.S. Office of Economic Opportunity. Dr. Martin Deutsch, Dr. Jack Victor, Elizabeth Taleporos, Dr. Cynthia Deutsch, Bataan Faigao, Edith Calhoun, Dr. Edward Ponder.
(Reports published by New York University, Institute for Developmental Studies, School of Education, New York, New York)

CHAPTER 4.

CHILDREN FROM THREE TO TEN: THE EARLY TRAINING PROJECT

Susan W. Gray

This is a report on the Early Training Project[1], a field research study Rupert Klaus and I began in 1961. We wished to see whether it was possible, by developing a carefully designed program, to offset the progressive retardation so often observed in the public school careers of young children from low-income homes. In 1961 many thoughtful school people were concerned with the problems such children experience in their schooling. The concern had by no means, however, reached the tidal wave proportions that it did in 1965 with the passage of the Economic Opportunity Act, including Project Head Start, and the Elementary and Secondary Education Act, also with a large element of funding for the disadvantaged. We, as directors of the Early Training Project, were fortunate in that we began at a time when public interest was not yet so great, nor programs for disadvantaged children so frequent, as to make it difficult to conduct a carefully planned and executed study without its being subject to a number of outside influences from competing programs and pressures for premature results. We were particularly fortunate in the Early Training Project to have the cooperation of a school system and its superintendent which made it possible for us to follow a relatively consistent program over the years. It was also our good fortune to work in communities where there was little outward migration. Such outward migration is of course a major problem in following up children over the years. Even at the end of seven years, we had so little moving away that it was possible to test almost all children who had been involved in 1962. Finally, we were fortunate in having predictable funding, from the National Institute of Mental Health, for the first five years of the study. It was this combination of factors that enabled us to follow the children we studied over six years.

The Children and Their Parents

The children with whom we worked, and a local comparison group, lived in a city of about 25,000 in the upper South. All children were black. At the time they were originally selected, the schools were segregated. Since it is necessary to have the continuing cooperation of the schools, we thought it wise to work with either white or Negro children. We had some reason to think that, in this particular town, there was greater chance of success with the black families.

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[1] This study received its major financial support from the National Institute of Mental Health through Grant HD - 00973. This report is adapted from two technical reports which may be found in Klaus, R.A., and Gray, S. W The Early Training Project for Disadvantaged Children. A report after five years. *Monograph of the Society for Research in Child Development*, 1968, 33 (No. 4), and in Gray, S. W., & Klaus, R. A. The Early Training Project: a seventh year report. *Child Development*, 1970, 41, (Dec.).

A census was made of all black children born in 1958. From it 61 children were selected according to various indices of educational disadvantage. All the families were well below the usual cutting lines for poverty, the average income was about $1500 at this time. Education of parents was somewhat higher than one might have expected, the average being about the 8th grade. Educational achievement, however, probably was lower than the last grade completed. The occupational level tended to be low. Mothers, for example, did domestic work, or else worked as maids in restaurants and beauty parlors. Fathers, where present, were generally employed in unskilled or semi-skilled labor. Families were large, the average being seven members. Housing conditions, except for those who lived in a public housing project, were extremely poor.

The General Rationale of the Children's Program

Our study began with a concern for progressive retardation. Our goal was to test experimentally whether it was possible to offset such retardation as a child moved through the public schools. Our general program was built up out of a careful search of the scientific literature on social class and its relation to development, on intellectual development, and on the development of attitudes and motives. We talked to school people who had had considerable experience first-hand with disadvantaged children; we discussed it with social workers and public health nurses.

It seemed to us as we searched the literature and talked with those we knew, that the problems disadvantaged children had, seemed to fall into two broad groupings—those things related to the skills, competencies, and understandings the child had, and those things related to his attitudes, and those of his parents, toward school expectancies. We finally came up with the following list:

Attitudes relating to school success. This included the child's motivation to do well in school activities, his general liking and interest in such activities, his willingness to work hard over a period of time, and the presence or absence of successful persons after whom he could pattern himself. We believed that this cluster of attitudes was of particular importance because it might be expected to have some sustaining effect after a special preschool program was completed.

Aptitudes relating to school success. By this we meant the skills and knowledge which form the necessary basis for being able to make progress in school. We broke aptitudes down into the development of language, the ability to order or make meaning out of the environment (concept development), ability to see small likenesses and differences, necessary for example in learning how to read (perceptual development).

Our study of first grade children at this school, and the studies of other researchers in other locations, had indicated that disadvantaged children came into school somewhat behind others, and that it was difficult indeed to enable such children, with all the handicaps of a poor environment, to catch up with more fortunate children. This was our major reason for beginning our program three summers prior to school entrance, and for making our major emphasis on what might be called a developmental rather than a remedial program. We planned to address our attention not so much to deficits as to the strengths the child already had or those he seemed capable of developing.

The General Design of the Study

In setting up the program we had three major concerns: (1) Planning a program that would be effective in offsetting progressive retardation, (2) planning a program which, if it should prove successful, would be possible to adopt on a widespread scale, and (3) from the stance of research, setting up a procedure that would give a clear-cut answer to our question of whether it was possible to offset progressive retardation.

Weighing these three factors, we came up with a plan beginning with the children, as already mentioned, at least three summers prior to school entrance, with a carefully designed intensive program, and with the best scheme of evaluation we could devise. From the standpoint of adopting the program on a widespread scale, we planned a procedure in which the major efforts for the children would be in the summer months, when both school buildings and staff members were readily available. Because we knew, however, that much would be lost from one summer to the next in young children living in an extremely impoverished environment, we planned a bridge from one summer to the next. This bridge was the provision of weekly home visits during the rest of the year. In the interest of the most precise answer possible to our question we developed a relatively intensive testing program over the years, one which will be described later. We also made an attempt to check in our plan for the possible effect of living in the community in which our program took place upon children not directly in the program. This we did by setting up one comparison group in the town which was our major focus, and another comparison group in a similar town about 60 miles distant. The general picture of the actual layout of the study is given in the accompanying table.[2]

The problem of evaluation, both before, during, and after the intervention program, was a major concern of ours. In the general area of aptitudes there are some well constructed standardized tests which assess some of the things in which we are interested. The particular measures that we chose were the Stanford-Binet Intelligence Test, the Peabody Picture Vocabulary Test, and the Illinois Test of Psycholinguistic Abilities. Our major concern was to be directed at how the children did in school, as defined largely by their performance on achievement tests, and by what other data we could pick up in terms of their general classroom performance. During the school years, our most consistent recourse was to the achievement test used in the public schools, the Metropolitan Achievement Tests, and at one time the Stanford Achievement Tests. These tests while extremely useful are, as other tests, limited in their applicability. They do not assess many things which we had attempted to teach; they do assess a number that we do not attempt to teach. On the other hand, we felt that they were in general our most useful indices of the child's performance.

We were concerned, however, with attempting to assess the changes that we might, or might not, have produced in the attitudes of the child. This is an extremely difficult thing to do. Adequate tests for children of preschool age in this general area are almost nonexistent; they are far from adequate on the school level. There are a number of reasons for this. One of them is the great complexity of the problem. As difficult as it is to assess intelligence, it is far more difficult to assess, except indirectly, one's feelings of self-esteem, and one's desire to achieve or to approach a standard of excellence. We did use a number of informal tests in these areas, largely ones that we could construct ourselves, or adapted from the work of others. In many cases, however, we were driven back to making the assumption that such motivations were a necessary condition for school achievement, and without them the child would not do well in school. Although our interest in trying to make changes in the attitudes of the children was fully as great as our interest in altering the general aptitude status of the children, the paucity of measures in the attitude domain means that most of the results to be presented later center around tests of intellect and school achievement.

One aspect of our study which does not appear in the general layout is our evaluation of the performance of younger and older brothers and sisters of the children with whom we have been working. It is a question of great practical importance, if focusing one's efforts upon one child, and his mother, may have positive, or even negative, effects upon the other children in the family. Some of our results on this matter will also be reported later.

The Summer Program for the Children

For our two experimental groups we chose lead teachers who were experienced in first grade work, and had particular understanding of disadvantaged children. Both of them were black. Each group of 20 children had four small group teachers who worked with about five children each. These were equally divided as to race and sex, and were undergraduate or graduate college students interested in acquiring more experience with young children. We had teachers of both races, since we felt it important for our children to see both whites and blacks working in equal status in a teaching role. We also felt it important to have some men teachers, particularly for the children from father-absent homes.

Most of the four-hour daily program was spent in activities with the small group teacher, alternated with brief sessions with the total group. The materials and activities used in the summer sessions were not radically different from those used in the more conventional nursery school or kindergarten. The difference lies rather in the way the materials were used, the particular patterning of activities, and the conscious attempt in all the activities to focus on those aspects of attitudes and aptitudes which we were trying to develop, and the high ratio of adults to children.

An illustration of this might be that of what one does with wheel toys, much loved by young preschool children. Being allowed to ride them was seen as a reward of the program. Tricycles, for example, were used to increase language in children. It is easy to set up

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[2] This table is reproduced, in slightly altered form, from: The Early Training Project: a seventh year report. *Child Development*, 1970, 41, Gray, S. W. & Klaus, R. A.

LAYOUT OF GENERAL RESEARCH DESIGN

Treatments	T_1 Three Summer Schools	T_2 Two Summer Schools	T_3 Local Controls	T_4 Distal Controls
First Winter 1961-62	(Criterion development, curriculum planning, general tooling up)			
First Summer 1962	Pre-test Summer School Post-test	Pre-test Post-test	Pre-test Post-test	Pre-test Post-test
Second Winter 1962-63	Home Visitor Contacts			
Second Summer 1963	Pre-test Summer School Post-test	Pre-test Summer School Post-test	Pre-test Post-test	Pre-test Post-test
Third Winter 1963-64	Home Visitor Contacts	Home Visitor Contacts		
Third Summer 1964	Pre-test Summer School Post-test	Pre-test Summer School Post-test	Pre-test Post-test	Pre-test Post-test
Fourth Winter 1964-65	Home Visitor Contacts	Home Visitor Contacts		
Fourth Summer 1965	Follow-up Tests	Follow-up Tests	Follow-up Tests	Follow-up Tests
Fifth Summer 1966	Follow-up Tests	Follow-up Tests	Follow-up Tests	Follow-up Tests
Seventh Summer 1968	Follow-up Tests	Follow-up Tests	Follow-up Tests	Follow-up Tests

a situation where a child can obtain something only if he asks for it. Later on we made it necessary to identify the particular tricycle the child wished. He must learn to interact with another child to "ask for a turn." In the second summer it was possible to use tricycles in a miniature traffic situation. The children learned to respond appropriately to traffic signs, and to play traffic officer.

Books were one of our most important materials. We read to the children several times a day; we encouraged them to look at pictures as we read, to talk about what was being read, to tell what would happen next in the story, and even, as time went on, to dramatize some of the familiar folk tales such as *Little Red Riding Hood* or *Three Little Pigs*. They were given small, inexpensive books as rewards for efforts relating to the goals of the program.

We are often asked whether ours was a "structured" program. If by structure it is meant that we lined children up in rows and rigidly administered the same program to all the children every day, the answer is "no." If by structure it is meant, however, a carefully planned program in which activities were sequenced over time, beginning with simpler ones for a given child and proceeding on to relatively more complex ones for him, our program was a structured one — in a highly individualized way.

The Work With Mothers in the Homes

The work with mothers was originally planned to provide a bridge from one summer to the next because we feared that over the 9 months between one summer and the next, the children would lose most of what they had acquired. A home visitor spent about one hour each week in the home. She worked with the child and, more importantly, with the mother in an attempt to carry on activities similar to those of the summer school. Our home visitors were Negro women in their forties with considerable teaching experience with young children.

The first aim of the home visitor was to involve the parent as an active participant. This was not easy, because many of the mothers were experiencing the helplessness often found in disadvantaged groups. The families were large, and many had no father. The mother had a heavy burden of coping with the subsistence activities that are obvious in a family with an average size of seven, and with an average income of only $1500. Although many of these mothers themselves felt beaten by life, they still had hopes for their children. The home visitor's effort was to provide them with some skills and understandings which would bring them a little closer to realizing these hopes for their children.

The Effects of the Program Upon the Children

The table which gives the layout of the general study shows that by 1968 the children had been tested eight times. These were in addition to a number of other *ad hoc* evaluation instruments used from time to time.

The data of this study are voluminous, and only two kinds have been selected for extended discussion: results on intelligence tests, and on school achievement tests. Some mention will also be made of our efforts to test attitudes.

Figure 1[3] gives a graph of the results upon the Binet test of intelligence from May, 1962, before any program for the children, to June, 1968, when the children had completed fourth grade.

Although the graph looks simple, there are a number of interesting aspects associated with changes in the work with the children over time. It should be remembered in reading the graph that between May and August of 1962, May and August of 1963, and May and August of 1964, the first experimental group had, each summer, a special ten-week program. The second experimental group picked up its first ten-week program in 1963 and a second one during the next summer. All children went to first grade in September, 1964. They were tested at the end of that year, again in the summer of 1966, and again in the summer of 1968. The second group started at a slightly higher level, which probably explains the finding of slightly better performance throughout. The two control groups have continued to lag behind the experimental groups. The most decline over time was shown by the control group in another town, while the local control group was only a little behind the two experimental groups in 1968. The difference between experimental and control groups at the end of fourth grade was statistically significant; that is, it would occur only once in twenty times if there were not a real difference between the experimentals and controls. It is, however, a modest difference. The picture then is one of relatively adequate progress in the experimental youngsters, in so far as intellectual ability goes, up to the end of first grade. With the control groups there was an acceleration during the first grade that brings them closer to the experimental groups. The surprising thing was that there was still a difference after nearly four years since the last assembled preschool for the children in the experimental groups. True, the difference was small, but it had been sustained over time.

The results on achievement tests to be presented are those on the Metropolitan Achievement Tests. There are eight subtests: word knowledge, word discrimination, reading, arithmetic computation, spelling, language, arithmetic problem-solving, and concepts. At the end of the first grade the experimental children were significantly superior on three of the four tests used at this level: word knowledge, word discrimination, and reading. The local control children were somewhat superior to the distal ones, which may be either a superior instructional program, or possibly the effect of contacts with the experimental children, and of the parents of each group with each other. We have evidence that the control mother sought out the experimental mothers. In 1966, five subtests were given. The experimental children were statistically superior on only two tests: word knowledge and reading. On the other three

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[3] This figure is reproduced, in slightly altered form, from: The early training project: a seventh year report. *Child Development*, 1970, 41, Gray, S. W. & Klaus, R. A.

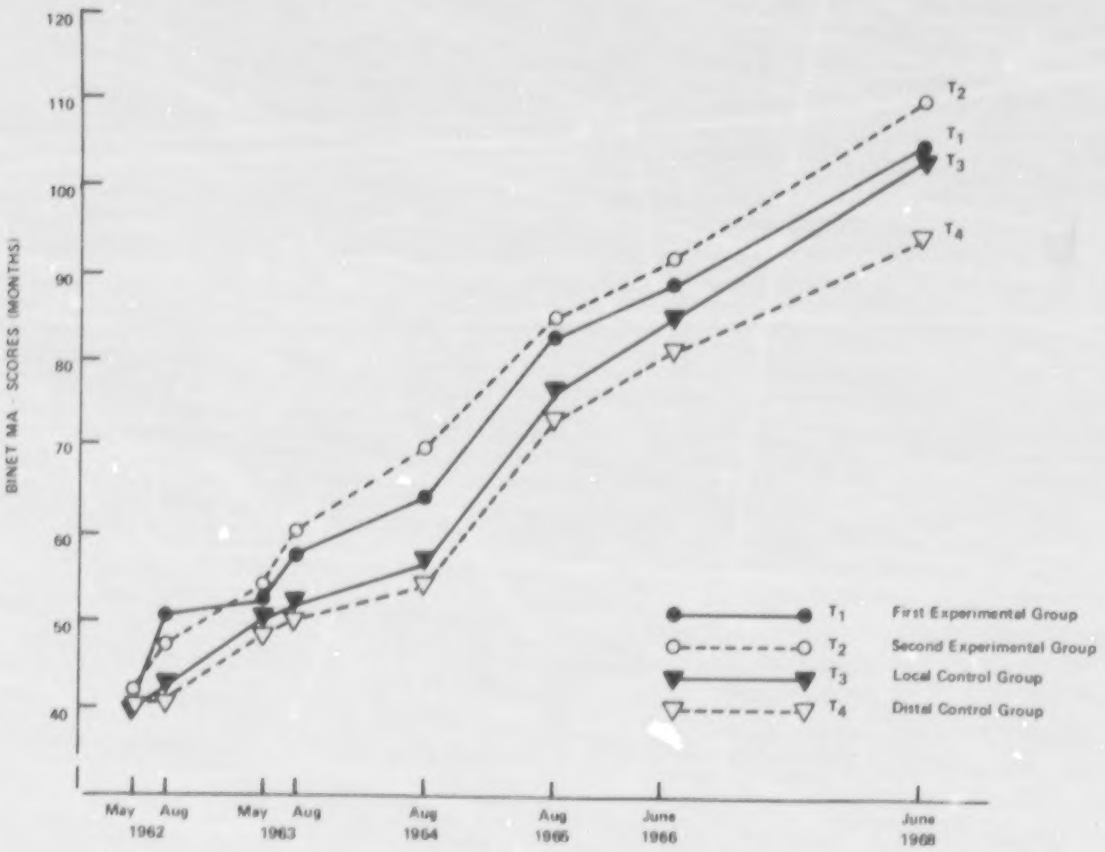

Figure 1. Mental ages for experimental and control groups on the Stanford-Binet

tests, however, there were approximately nine chances out of ten that they were superior. Again, the local control group was somewhat superior to the more distant one. At the end of fourth grade the experimental groups were no longer statistically superior. On six of the seven tests, however, their scores were higher, but the differences were small. There are some implications of these findings, as they relate to the interaction between early education and public schooling, which will be discussed later.

We have had considerable difficulty in developing any adequate measures of attitude changes in the children. No well standardized tests were available and those which we developed ourselves were simply too hurriedly put together to be effective for use. When one considers the amount of time and effort that goes into the careful developing and standardizing of tests such as the Binet or the Metropolitan Achievement Tests, it is not too surprising that our far less sensitive measures fail to show results. Two of these, however, will be singled out for mention.

We were particularly interested in the effect of the program upon the child's feelings of self-esteem, especially during their public school experience. We adapted and used the Piers-Harris self-concept test. On two of the seven scales the combined experimental groups exceeded the combined control groups—the dimensions of happiness and satisfaction. The test was used again at the end of 1966. This time the experimental children no longer showed more positive self-concepts than the control children.

We were also interested in the "reputation" of the children, that is, whether the child was seen as capable, well-liked, friendly, and so on, among his classmates. We were concerned here not only with whether we might have improved the reputation of children by intervention programs, but also whether the program might have had some deleterious effects. We used a picture adaptation of the *Who Are They?* test with the three local groups of children. There was some slight tendency for the experimental children to be seen as enjoying a better reputation. If there is no solid indication of a favorable effect of the program, there is certainly no indication of an adversive effect.

We were also interested in the effects of the program upon other children in the family. The younger siblings, when they became of a testable age, were given the Binet Intelligence Test. Here we found that the younger siblings of our experimental children were superior to the younger siblings of the control children. This was particularly noticeable in the younger siblings of the first experimental group, where the home visitor had been in the home for two years prior to school entrance. It also was more marked in the siblings closer in age.

With the older siblings, we tried to study the effects of the program on school performance, and also how the older child saw the family situation in terms of more attention and favoritism for the child in the intervention program. The comparison of the older siblings yielded little information. We found no evidence that school performance was improved — or hindered. In the same way we found no evidence that the older siblings resented the special attention given to a younger sibling.

The Implications of the Findings

The reader may remember that the original question posed by the Early Training Project was whether it was possible to offset progressive retardation.

With the results for the end of four years of public schooling, our answer is "yes," but it is a qualified "yes." Our experimental children on achievement tests performed better during the first two years of schooling than the control children. But at the end of fourth grade, the performance was slightly better, if at all. On intelligence tests their scores were still significantly higher, although the difference was a small one.

Our answer must be a qualified "yes," for preschool experience can only form a basis for the educational demands of public school. The schools in which our children were enrolled were not bad schools. At worse they were mediocre. On the other hand, they were not adequate in providing the kind of program that would enable these children to maintain their early gains.

Not all of this, of course, can be laid to the door of the schools. Unless the home circumstances of the child can be changed, the adversive environment which created the original problem will continue to take its toll. It is perhaps asking too much to expect the school to offset the inadequacies of the community and home.

By some standards the Early Training Project, with its three summers of intervention, may seem to be a relatively massive program of intervention. And yet a colleague of ours estimated that in the years prior to school entrance the maximum amount of time the child was in the project (approximately 600 hours) was less than 2 percent of his waking hours from birth to six years. The amount of these contacts in the home was a maximum of 110 hours, or about 0.3 percent of the waking hours of the child. Surely it would be foolish to think that such a small amount of intervention could have a lasting effect without considerable reinforcement from the child's home environment and from his subsequent schooling.

Our results through the fourth grade, and our findings on younger siblings, make us hopeful that intervention programs can have long-lasting effects that go beyond the immediate children with whom one may be working. On the other hand, the decline in the groups in intelligence over the years since intervention ceased, and the slowing down in educational achievement of the two experimental groups after the second grade, suggest that the intervention program before school entrance simply cannot carry the entire burden of improving educability. An effective early intervention program for a preschool child, be it ever so good, cannot possibly be viewed as a form of inoculation whereby the child is immunized forever afterward to the effects of an inadequate home and a school inappropriate to his needs. Human performance results from the continual interplay of the growing child and his environment. Preschool programs for disadvantaged children, well-conceived and executed, may be expected to make some lasting changes. They cannot, however, carry the whole burden of providing adequate schooling for disadvantaged children. At best they may provide a basic progress in schools and homes which can build upon the preschool program.

CHAPTER 5.

DOUBLE DEPRIVATION: THE LESS THEY HAVE, THE LESS THEY LEARN

Elizabeth Herzog, Carol H. Newcomb, Ira H. Cisin

In our society, academic adequacy is likely to be a prerequisite to economic adequacy, and economic adequacy is likely to be a necessary though not sufficient prerequisite to fulfilling one's maximum potential and achieving a satisfying way of life. The main exceptions to this generalization have been individuals with unearned income, the handicapped, and females. However, ability to earn a living has come to be as necessary for many girls as for boys. For the great majority of our citizens, the strong correlation between education, occupation, income, and self-esteem puts a high premium on educational competence.

Children of very low-income families, on the whole, do less well than children of the prosperous in the early years of school, and the discrepancy in school achievement increases as time goes on.[1] Accordingly, those concerned with the welfare of children have focused increasingly in recent years on ways of counteracting the academic difficulties of poor children. Since the early years are crucial, preschool enrichment programs are seen as a promising avenue to this goal.

One such program was initiated at Howard University, shortly before Head Start was launched. At the time this program was being planned, in 1963, there was much discussion of methods for giving to preschool children an experience that would lay the groundwork for enhanced school achievement. Some of the methods attempted or proposed were costly and elaborate, requiring special training and facilities. The project initiated at Howard University[2] was addressed to discovering whether, if children of poverty were given a traditional nursery school program of the kind offered to many middle-class children, they would have the foundation for satisfying school performance.

Implicit in the question was the assumption that, since well-trained nursery school teachers are alert to the special needs of each child as an individual, they would perceive and respond to the special needs of children who come from difficult environments. Implicit in the definition of a traditional nursery school approach was the need for the school to work closely with the parents, as is customary in the most highly rated middle-class nursery schools.

If it could be demonstrated that a traditional nursery school program would enable very disadvantaged children to meet national norms in school achievement, it would be possible to establish large scale preschool programs relatively quickly, without the need to give elaborate special training to the teaching staffs. This would mean that more children could be helped more quickly, and at less monetary cost, than would be possible with more elaborate "precision methods" of compensating for academic deficits.

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[1] Clark, 1965; Kennedy et al., 1963, Osborne, 1960; St. John, 1969.

[2] Directed by Dr. Flemmie Kittrell, Professor and Head of the Home Economics Department, and financed in part by the Children's Bureau Child Welfare Research and Demonstration Grants Program (D-185).

The children and their families

After considering, experimenting with, and discarding several alternative strategies of sample recruitment, it was decided that the most practical and direct method would be a house-to-house canvass, to recruit children for the nursery school program and a comparison group.

The criteria for including a child in the initial "pool" of candidates were: that in October 1964, he was not less than three and not more than three years and seven months old; that he was in generally good health, without gross visual, auditory, or orthopedic problems; that there was no obvious evidence of organically based mental retardation or severe mental disturbance. It was also required that the parents speak English, that the child had never been in formal group care, that the parents agree to bring the child to the University for psychological testing (referred to as "play sessions"), and—if their child were chosen for the nursery school program—that they agree to have him ready when the school bus appeared in the morning.

From the pool obtained in the house-to-house canvass, names were selected by random number: 38 from one tract for the experimental group and 69 from three neighboring tracts for the comparison group (in order to avoid possible unhappiness for comparison group parents who might see the school bus daily calling for their neighbors' children). With regard to demographic characteristics reported by the Bureau of the Census, the four tracts appeared virtually identical. All four were inhabited by very low-income families and, because of housing patterns in the District of Columbia, all the families were Negro.

Since some families moved away during the selection process and others either enrolled their children in other programs, failed to keep appointments, or dropped out for other reasons, the families in the program do not represent a strictly random selection. Nevertheless, this was by no means a self-selected sample. No family was permitted to volunteer participation without a prior invitation, and none was free to choose between entering the experimental or the comparison group. The nature and extent of selectivity can only be surmised, but presumably it affected the experimental group and the comparison group in similar ways.[3]

The numbers selected for the two groups were based on expectations of attrition. The hope was that it would be possible to retain 30 children in the experimental group (EG) and at least that many in the comparison group (CG), and it was expected that more of CG than of EG would be lost. Actually, attrition was surprisingly low. Families moved rather often, but usually within the metropolitan area, and vigorous efforts succeeded in maintaining contact with most of them. At the end of the two-year nursery school program, only one child from EG and two from CG had been lost to the study. Four years later, contact had been maintained with 36 of the 38 children in EG and 66 of the 69 in CG.

When the children entered kindergarten, it was necessary to reduce the size of EG to 30. This was done by excluding, regretfully, six girls who showed least need of a special program and one boy who needed it very much but could no longer attend.[4] The net result of this exclusion was to improve the sex ratio and lower somewhat the early mean IQ scores of EG.

At the outset of the project in 1964, EG and CG were similarly distributed in reported income, with a slight advantage for CG. Removal of the seven EG children increased this advantage, although median incomes for the two groups were still comparable: $3,360 for EG and $3,380 for CG. In both groups, the lowest income reported was about $1,000, and annual income extended up to $5,770 for EG. Two CG families reported annual incomes over $10,000 and one reported $7,500. Five other CG families reported annual incomes between $6,000 and $7,000, and all the rest were under $6,000.

According to the poverty-income criteria then used by the Social Security Administration, 21 children (70%) in EG and 42 (64%) in CG were living in poverty.[5] Four (13%) in EG and 14 (21%) in CG reported incomes officially defined as sufficient to meet the children's basic needs. The remainder fell between these in a borderline area with income far from adequate and below the amount described by SSA as the "low-cost level."

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[3] Kraft et al., 1968. Much of the description of sample selection and the nursery school program is excerpted or condensed from this report.

[4] In the interest of comparability, the figures presented here will include only the children who continued in the program throughout the five-year period: 30 for EG and 66 for CG.

[5] Orshansky, 1965.

The families of 5 children in EG (17%) and 17 (26%) in CG reported receiving financial assistance from the Department of Welfare. In other characteristics the two groups were generally comparable, with the following exceptions: graduation from high school for 11 (37%) of EG fathers as compared with 9 (14%) of CG fathers; somewhat better rating of EG housekeeping; better kept housing for CG; fewer people per room for CG, and less sharing of kitchen or bath with other families. There was also a greater frequency of reported father absence for CG than for EG—a variable which later showed no significant relation to test results, with the slight difference that appeared favoring the father-absent children. Three of these comparisons favored EG and three favored CG, with one reaching statistical significance (father's education, chi square = 7,48, df=p .01).[6]

The preschool program

The two-year preschool program at Howard University, as already indicated, followed the lines characteristic of a well run middle-class nursery school, with no specific "enrichment" features added. In many ways it resembled other preschool demonstrations conducted in the United States during the sixties. Some of its main features were:

1. It was conducted in a long-established nursery school run by a university for research and training purposes.
2. The children were enrolled at the age of three.
3. The nursery day was about seven hours long (eight hours including the bus trip to and from school) and included lunch, breakfast if needed, morning and afternoon snacks, and an afternoon rest period.
4. The children attended the preschool for a ten-month school year and a two-year time span.
5. Transportation was provided for all the children.
6. No fees were charged.
7. The teachers, under the general guidance of the Project Director and the Head Teacher, were allowed to modify the usual nursery school activities to fit the special needs of these children.
8. Special efforts were made to involve the children's parents. A full-time "adult worker" (parent educator) on the staff served the families of the children.
9. Evaluation of the program was conducted by a team that was independent of the service staff.[7]
10. Provision was made for a continuation of special school beyond the preschool phase of the demonstration.

Full details about the program and the recruitment process are given in the published report of the first two years.[8] It may be mentioned here merely that the equipment and setting were excellent, and the curriculum much what would be expected in an average middle-class nursery school. In their exit interview, the teachers regretted that the special needs of these children left them less time than they would have wished to devote to language development. The published report includes the opinion of the research staff that "although the program was much like that of good, traditional-type nursery schools, there was less conversation with individual children—less supporting or initiating of conversation—than one would usually find in a university laboratory preschool that serves middle-class children or in a superior suburban preschool. The explanation may lie in the amount of attention to other aspects of the program that work with deprived children entails. However, that may be, it seems likely that the teachers were right in thinking that more attention to language development was needed. . . ."

Two of the teachers suggested that the ideal teacher-pupil ratio for work with children from low-income homes would be one teacher and a full-time trained aide for every five or six children. Actually, the ratio was one teacher to twelve children, plus a Head Teacher, a "floating" teacher-assistant, and a large number of student aides (undergraduates in childhood education courses) who were seldom on duty for more than two consecutive hours, since they had to fit their attendance to their course schedules. The research staff figured that the effective teacher-child ratio, including aides, was about one to eight or more.

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[6] Since some parents who claimed 8 or 10 years of schooling could barely read or write, since income level favored CG rather than EG, and since mother's education was similar, the difference in reported group means for father's education seems of little practical significance.

[7] During the nursery school years, staff members of the Children's Bureau conducted the evaluation. From then on, Dr. Ira Cisin (Director, The George Washington University Social Research Group), who had served as statistical consultant during the first phase of the project, directed the administration and evaluation of the continuation project, under a grant from the Children's Bureau.

[8] Kraft et al, op. cit.

The overall atmosphere of the nursery was permissive and warm and it was characterized by knowledgeable observers as "clearly a benign and pleasant setting for young children."

Involvement of parents was an important part of the project plan, and efforts to involve them were reasonably successful. The term "parent education" was avoided and the aim was to involve the parents as competent partners working for their children's present and future well-being. Some degree of success is indicated in the continued devotion of the mothers to the "adult activities worker" and their eagerness to talk with her after a separation of two or three years. Yet, as the report of the nursery school program comments, "In practice it was more didactic and less a meeting of 'partners' than it was in theory," and the response of the parents—although stronger than in many other programs—fell somewhat short of initial hopes.

The first school years

In the hope of consolidating any benefits gained during the nursery school program, a series of special school situations was arranged for the 30 EG children during the three years immediately following nursery school. The problems involved in setting up and carrying through such arrangements are a saga in themselves, and although this is not the place to rehearse that saga, it must be stated at least that a number of overburdened school officials were generous, resourceful, and energetic in making possible the continuance of the project.[9]

Throughout the kindergarten year, the EG children were in one class in a public school. The full day session included a light breakfast and full lunch, and an afternoon rest hour. Two skilled teachers were assisted by two aides, to provide an enriched curriculum with emphasis on language skills and reading readiness. Frequent special trips to educational and recreational facilities included visits to the *Washington Post* Book Fair, a farm, a dairy, a fire department, the circus, a department store.

A part-time social worker was available to provide assistance for the children's families. In cooperation with the teachers, she was able to arrange for providing shoes and warm clothing for children who would not otherwise have attended school, and to obtain medical and dental care for some who needed such attention. Her work also included conferences with all the families of the children, and referrals or direct assistance in times of crisis.

During the first and second grades, an enriched classroom experience was again provided for the children. However, during those two years, an additional 30 children, drawn from the "regular" classes, were assigned to the program. EG and the new group were divided equally between two classrooms, in order to avoid excessive insulation of EG. During the first grade, a team of three teachers, assisted by an aide, provided for both classes small-group reading instruction and team teaching in science, social studies, and language. In second grade, although the two principal teachers worked cooperatively, no organized team teaching was attempted. Instead, a flexible schedule was provided so that the slower learners from both classrooms could go to a third teacher for small group instruction in all phases of second grade work. Educational trips were again included. The part-time social worker continued to give social service assistance to the families. In addition, she helped to keep communication open between home and school.

To insure holding the group together, transportation was provided for EG throughout kindergarten and the first two grades. Arrangements were also made for the children to receive lunch from the free lunch program. Unfortunately, exigencies of the school system made it necessary to have the children in a different school each year. The shift of locale was somewhat eased by the fact that the Head Teacher during the kindergarten year remained with them during the first grade. Second grade, however, brought a change both of school and of teaching staff.

After completing the second grade, EG left the special situation and entered into the regular classes of the public schools that served their respective neighborhoods. How such a transition affected them has been an important and disturbing question for the research staff, and one on which final conclusions are yet to be reached. The staff has continued to keep in touch with the families, although the program proper terminated with the end of the second grade year, in 1969.

Program Evaluation

Since the purpose of the program was to enhance the school performance of children from very poor families, the true test of its effectiveness will be their actual school performance as compared with that of children who are similar in other respects but did not experience such a program. This kind of comparison will be convincing only after the children in the experimental group have had enough time to accommodate to a "regular" school situation and have progressed at least through the fifth grade. Some soundings along the way are available, however, in the scores of intelligence tests administered since the beginning of the nursery school program, school achievement tests administered in the second and third grades, and in the grade placement of the EG and CG children at the beginning of the fourth grade year.

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[9] Thanks are due especially to Miss Evelyn Bull, Director, Supervision and Instruction in Elementary Schools, and Mr. Bradford Tatum, Assistant to Assistant Superintendent in charge of Elementary Schools.

Since the tests administered by the project are designed to assess school-related skills, they serve as rough and by no means conclusive predictors of potential school achievement.[10] The school achievement tests are useful indicators of relative performance. However, aside from any questions about their relation to actual school performance, the achievement test scores are somewhat confounded by the elimination of the least proficient children from CG, through failure to be promoted from first to second grade, while EG was artificially kept intact through the second grade year. This possible distortion was partially corrected the following year by the failure of some children in EG to be promoted from second to third grade. However, the school achievement test was administered rather early in the third grade year (November) when a number of children in EG (according to the reports of their parents) were still struggling with problems of transition to a new school and a new, unsheltered school situation.

Similarly, the relative proportions of children who failed to be promoted may be subject to later modification, since CG had been subject to possible non-promotion four times and EG only twice.

For all these reasons, the present measures must be regarded as provisional and subject to confirmation or revision when the children reach the later school grades.

Two conclusions, however, are already firm and unlikely to change substantially. One is that, to paraphrase a comment by Weikart concerning a similar program, the results so far are not as discouraging as might have been feared nor as encouraging as had been hoped.[11] The other is that to evaluate such a program merely by comparing means for an experimental and a comparison group conceals as much as it reveals. Only by subgroup comparisons can a program be adequately evaluated.

The remainder of this chapter will be devoted to documenting these conclusions and discussing some related implications for programs and for program evaluation.

Project tests

A battery of tests has been administered to EG and CG every year, from 1964 through 1969. The Stanford-Binet Intelligence Scale (1960 revision) and the Peabody Picture Vocabulary Test have been included in each round of testing. During the nursery school phase two additional tests were included: the Illinois Test of Psycholinguistic Abilities and thirteen subtests of the Merrill-Palmer Scale of Mental Tests. After the children entered kindergarten, these two tests were discontinued, and the Goodenough Draw-A-Person Test was substituted in the testing rounds for 1967, 1968, and 1969.

Thus, for almost all of the 96 children in EG and CG, there are available the results of two tests administered six times at yearly intervals (1964-1969), of two others administered in the three early test rounds (1964-1969), and of one other in three later test rounds (1967-1969). One verbal subtest of the Stanford Achievement Test was also administered in 1969.

Dr. Norman Milgram (Catholic University, Department of Psychology), on the basis of previous experience with children of this age and socio-economic level selected the tests and directed their administration. Graduate students, numbering from four to eight in the various years, administered the tests. All of these students had participated in a training practicum during which they used the tests with disadvantaged children of appropriate ages. In each round, some of the testers were Negroes and some were white. The majority of the testers were women.

During the first two years all testing sessions were held at Howard University. Since the children in EG were brought from the nursery school by a staff member, while the others came in from outside with a family member, the testers were clearly aware which children belonged to each group. Whether this knowledge would constitute an advantage or a disadvantage cannot be ascertained. The director of testing believes that it had no effect. Some disadvantage for EG may have been involved in the occasional need to interrupt a child's lunch or his nap in order to meet the testing schedule.

During the next three years, testing sessions were held at the George Washington University, and every effort was made to avoid identifying the children as belonging to EG or CG. Analysis has not revealed any changes in relative scores that seem related to the difference in the testers' awareness of EG and CG identity. This does not mean the absence of such an influence, but merely that its direction and magnitude remain unknown. In any case, it is reassuring that the later findings, beginning with 1967, are not subject to concern on this score.

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[10] For convenience, these will be referred to as "project tests".

[11] Weikart, 1967.

They are, of course, subject to other kinds of concern, the major one being the nature of the tests. They were used because, in the judgment of the consultant, they were the best available. This does not obviate questions about the extent to which test findings reflect the school-related abilities of these particular children. No effort will be made here to enter into this complex problem, but its existence cannot be ignored.

Concern about the "real meaning" of the test results has been reinforced by analysis of testers' systematic ratings, individual test protocols, and group means. That mutual language problems existed is abundantly clear, especially in the earlier records. That some language problems continued is also clear, not only from the records but also from conversations with the testers. One example occurred when the children were in first grade. During the test session, a child was asked to give a word that rhymes with "red." He gave no sign of understanding what was wanted. Finally his face lit up and he said, "Oh, you mean 'raid'." The tester nodded and he said, "Why, 'haid,' of course."

Such an incident, and others like it, give grounds for serious thought. They also suggest the dubious foundation provided by a single round of testing, or even by testing limited to one "before" and one "after" test round. The present instance which provides a series of six sessions, offers opportunity to review the level of each child in succeeding years and to form some estimate of his "true" level of performance on these tests. Some children maintained rather stable levels from year to year. Some varied in an erratic pattern. Others showed children, after achieving levels far above the group norm, showed a striking decline in test scores that seemed to reflect family stresses and crises which were known to the research staff. One of these was the child who gained the largest number of IQ points (45) on the Stanford-Binet during nursery school, sank from 122 in 1966 to 108 after second grade, and failed to be promoted at the end of third grade.

Whatever the defects of the tests as reflectors of a child's innate ability, they do offer some estimate of his competence in the skills required for gratifying school performance—including the ability to take tests. Since the stated purpose of the project was to enhance school performance, it is possible to accept them as adjuncts of evaluation, even while regretting our own failure to have discovered or devised more conclusive measures. The regret is tempered only mildly by knowledge that we already have some basis for comparing what the tests say a child can do with what his teachers say he is doing, and that as time goes on this basis will be enlarged and made more firm.

The Stanford-Binet Intelligence Scale was chosen, and used throughout the program, because it is one of the best constructed, best standardized, and most widely used tests of intelligence available. For these reasons, and because space is limited, the results of project tests will be limited to that one, reserving the findings from the whole battery for later full report.[12] Accordingly, all IQ scores given will be derived from the Stanford-Binet Intelligence Scale (1960 revision).

The Peabody Picture Vocabulary Test has also been used in each testing round. However, its scores have varied surprisingly enough, and have conflicted with the findings of other tests and of school records often enough, to raise serious doubts about its contribution to this kind of evaluation. These doubts are reinforced by our own item analysis and by the experience of some other investigators—although still others report that it has served satisfactorily. Our doubts are further reinforced by the fact that the correlations of the PPVT with the various school measures are substantially lower than those of the Stanford-Binet. It should be added that the Draw-A-Person Test contributed little to the analysis for this particular project.

IQ Means, Experimental Group and Comparison Group

Mean IQ scores will be presented in a series of figures, for which the corresponding tables will be found throughout this Chapter. The mean scores for total EG and CG throughout the five-year period from the beginning of nursery school through second grade are shown in Figure 1 and Table 1.

At the outset of the program, in 1964, the mean IQ score of CG was 4 points higher than that of EG, although the difference was not statistically signif-

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[12] The published report of the nursery school years presents findings for all the tests used before 1967. Kraft et al., op. cit.

TABLE 1

MEAN STANFORD-BINET SCORES, 1964-1969

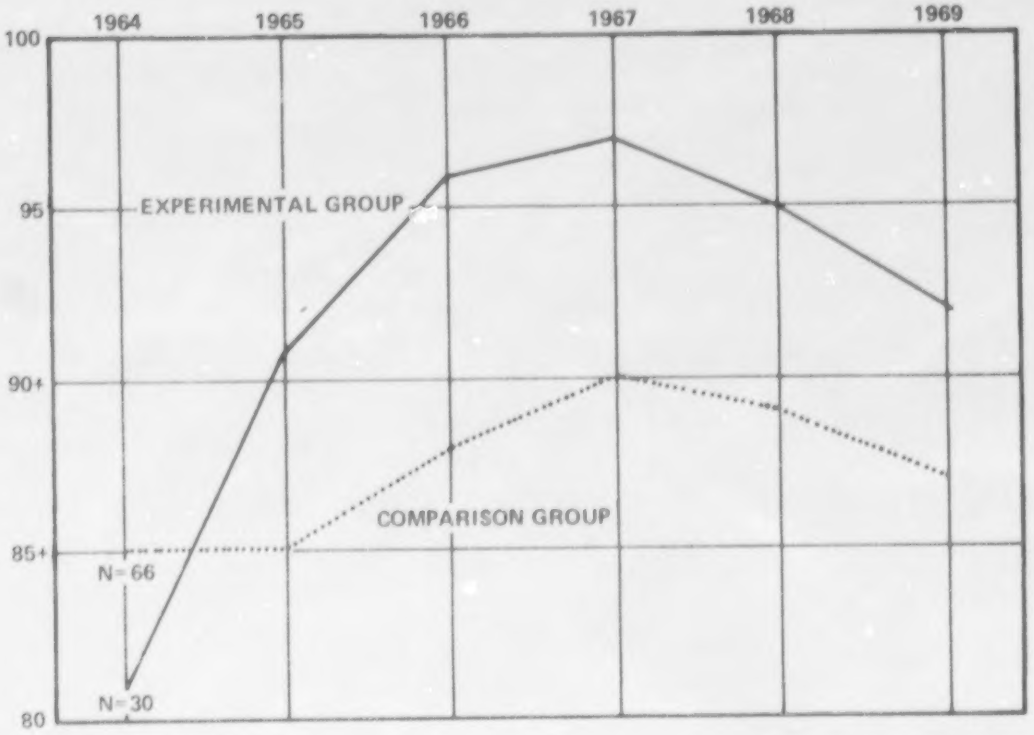
	N	1964	1965	1966	1967	1968	1969
EXPERIMENTAL GROUP							
Standard Deviation		11	11	10	14	15	13
Mean Scores	30°	81	91	96*	97	95	92
COMPARISON GROUP							
Mean Scores	66°	85	85	88	90	89	87
Standard Deviation		11	13	13	13	13	12

° One EG child not tested in 1966; one to four CG children not tested in 1964, 1965, 1966 and 1968.

* t value of difference between EG and CG, statistically significant: t = 3.26, p. <.01.

Note: For the sake of clarity, t values are considered only for the years 1964, 1966 and 1969.

Figure 1. Mean Stanford-Binet Scores, 1964-1969



icant.[13] At the end of the nursery school program, in 1966, the mean score of EG (96.5) was significantly above that of CG, and this level was maintained through kindergarten. By the end of the second grade year, however, the mean scores of both EG and CG had declined, and the difference was no longer statistically significant.

The decline in IQ scores for both groups after 1967 is a phenomenon that has come to be familiar in other studies of low-income children.[14] Some investigators attribute it to the fact that successive levels of the Stanford-Binet test become increasingly verbal, and that verbal facility and communication pose major problems for children from very low-income families.[15] Some attribute it rather to deficiencies in the tests, and some to the nature of the public school experience. All three elements may play their part. The fact remains that both EG and CG showed a loss in mean IQ scores after entering the public schools.

That both EG and CG showed gains during the first years of the program may well result to some extent from experience in test-taking. Since school achievement depends in some measure on the ability to take tests, and since presumably the effects would operate similarly for both groups, this probability can be recognized without dismay—but nevertheless must be recognized. It is possible also that CG responded to some extent

The similar droop of the two lines from 1967 through 1969 suggests that the program did not protect EG from the loss in mean IQ score that has been reported so often. What it did, apparently, was to provide a higher level from which to descend. If the present pattern continues, the mean scores of EG and CG may converge. Whether this happens remains to be seen. Project tests were not administered at the end of the third grade year but are planned for the following year. Since at least one project has reported that the apparent effects of a preschool enrichment program were more perceptible in fifth grade than in first grade, the question remains open.[16]

The effects of preschool enrichment programs are often reported in terms of IQ point grains. The mean grain in IQ points of EG was significantly larger ($t=4.93$, $p < .001$) than that of CG, for the years 1964-1966 and also ($t=2.94$, $p < .01$) for the years 1964-1969. The losses of the two groups in the years 1966-1969 were not significantly different.

Since EG began four points below CG and since it later appeared that some initial scores in both groups were spuriously low, comparison of mean points gained seems less illuminating than comparisons of later score levels and change patterns. Moreover, there appears to be a tendency, on the whole, for those with lower initial scores to gain more points than those who begin higher on the scale—a tendency that may not be wholly accounted for by spuriously low initial scores.[17] For these reasons, although mean gains in IQ points will be noted from time to time, more emphasis will be placed on score levels and patterns, especially in the latest year available, 1969.

This reasoning prompts a question about the proportions in each group who, at the end of the second grade year (1969), fell within or above the "normal" range, generally assumed to lie between 90 and 110. At the end of 1969, 60% of EG and 37% of CG scored 90 or above—a statistically significant difference (chi square $= 4.93$, $df = 1$, $p < .05$).

School achievement tests

Two tests were administered by the public schools: The Metropolitan Achievement Test (MAT), was given to all second grade pupils at the end of the school year (1969), and the Comprehensive Test of Basic Skills (CTBS) in November, 1969—that is, near the beginning of the third grade year.

MAT.[18] Scores are available for 28 EG children and 40 CG children. Eighteen CG children were omitted because they had not been promoted from first to second grade, and the others were absent from school, or attended parochial or Maryland schools which did not administer the test. Since the children in EG were arbitrarily kept together through the second grade year, the absence of children judged to be less proficient in school-related skills may have raised the relative score level of CG somewhat.

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[13] The .05 level of significance has been selected as our criterion, and any difference designated as statistically signficant will meet or exceed this level. Differences falling short of that level will be regarded as non-significant. A number of the differences to be reported do fall short of the .05 level, but over the five-year period form patterns too consistent to be dismissed.

The significance of differences in mean scores was measured by t tests, and chi square was used to test differences in proportions of children within various classifications. Values for t and p, not included in the text, may be found in the tables.

[14] Gray and Klaus, 1969; Larson and Olson, 1968; Weikart, op. cit.

[15] Cronbach, 1960.

[16] Deutsch and Brown, 1964.

[17] Kraft et al., op. cit.: Appendix.

[18] The MAT and CTBS subtests are reported below in connection with subgroup analysis.

The mean scores of EG as a group were slightly above CG on four verbal subtests of MAT, and in one of these the difference reached statistical significance. However, EG was non-significantly below CG in arithmetic.

CTBS. A new test, the CTBS, was administered to all third graders in the public schools of the District of Columbia in November of 1969.[19] By this time, several more children in CG and some in EG had failed of promotion, so that any effects of removing the less proficient children were also diminished. Whether the test performance of the children in EG was affected by transition problems cannot be determined. In any case, the mean scores of EG and CG for the three verbal and four arithmetic segments of CTBS were very near to identical.

Children at or below grade level

If, at the end of the school year, a child is promoted to the next higher grade, the probability is that the teacher thinks he is ready to move a step higher. There are exceptions, of course. He may be promoted because he is considered too old to spend another year in the same grade, or there may be some other reason for a "courtesy" promotion. On the other hand, if he is retained for another year at the same grade level, there is little doubt that the teacher thinks he is not ready for the next one.

Ordinarily, promotion or retention would seem to be the acid test. If the proportion of EG children at or above grade level is substantially larger than that of CG, it should be relatively convincing evidence that the program had been helpful. In the present case, however, there have been only two opportunities to deny promotion to the children in EG, while the children in CG have been subject to retention since their kindergarten year. Therefore, the proportions at or above grade level must be viewed as provisional until the EG children have been in a regular school situation for several years. Nevertheless, although figures on grade placement may not tell the whole story, they do tell an important part of it.

When the children began the fourth grade year (1970), 67% of EG were at the expected grade level, as compared with 53% of CG. That is, one-third of EG and over one-half of CG were below grade level at the end of the third grade year. That such proportions have come to be proverbial in inner-city schools does little to mitigate their impact when they involve children who, over a period of more than five years, have been known to the research staff as responsive and apparently "normal" little human beings.

That the Stanford-Binet scores have some predictive value is evident in the fact that the correlation between the 1969 mean scores and grade placement at the beginning of the fourth grade year is .30. That the prediction is merely approximate is shown by the relatively small size of the correlation coefficient.

The three prime variables

The further our analysis has proceeded, the more evident it has become that the total group means mask a number of striking subgroup variations, within and between EG and CG. These subgroup differences, in themselves, do not tell how to modify the program to give more help to the children who have benefited least by the program they experienced, or how to enhance and solidify the benefits for those who have gained most. But they do indicate which kinds of children have responded more and which less to this program. And, as an experienced investigator remarked about a very different program, "in that 'which' the 'how' may be concealed."[20]

In the present analysis, three variables show strong and systematic relations to patterns of IQ scores: sex, initial IQ (IIQ), and socio-economic status (SES). These three variables differ basically. Sex and SES–unlike IQ score–are independent variables. Classification by sex involves a natural, unequivocal dichotomy. IIQ is a first application of a measure used in assessing the outcome of the project and, like SES, represents a crude estimate, subject to varying and disputed definitions and assessments.

Very early in the analysis it became apparent that, although EG and CG were generally comparable, the proportions of EG and CG falling within the classifications based on the three prime variables differed in important ways.

Sex. Both EG and CG had about the same proportions of boys and girls, with two more girls than boys in EG and four more in CG. However, the numbers of each sex falling within the different IIQ and SES classifications varied considerably.

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[19] CTBS/McGraw Hill 1970.

[20] Witmer, 1960.

Initial IQ (IIQ). The median of the 1964 IQ scores was slightly above 80 for CG and slightly below 80 for EG. In order to use the same cutting point for both groups, a mean of the medians was accepted. Initial scores of 80 or over were classified as "higher IIQ" and initial scores under 80 were classified as "lower IIQ." For convenience, the children in each classification will be referred to as "Hi-IIQ's" and "Lo-IIQ's."

This classification results in identical means for the high and low classifications in EG and CG in 1964. However, the proportions of "Hi-IIQ's" and "Lo-IIQ's" are quite different, the majority of CG (42 or 66%) being classified as Hi-IIQ and the majority of EG (17 or 57%) being classified as Lo-IIQ--a difference obviously to be reckoned with. In addition, the two IIQ levels in CG divided rather evenly between boys and girls, while in EG twice as many girls as boys were Hi-IIQ and more boys than girls were Lo-IIQ.

	EG	CG[21]
Hi-IIQ-M	4	20
Hi-IIQ-F	9	22
Lo-IIQ-M	10	11
Lo-IIQ-F	7	11

SES. Since classification by SES within a low-income group is less familiar than classification by sex or IIQ, and since SES reveals important relations to patterns of IQ change, it requires somewhat extended comment.

The method used to divide EG and CG into higher and lower SES classifications combined the number of years of education of the child's mother with the person-to-room ratio. Mother's education rather than father's was used for two reasons: (1) both theory and observation suggest that, during a child's earliest years, the mother's influence is likely to be more direct and more perceptible than the father's; (2) the number of absent fathers was large at the outset of the program and increased as time went on.

As developed, the method has two advantages: the use of relatively objective and easily obtained indicators, and a classification that coincides with subject judgments about the families we have come to know over a period of several years.[22] Because the range of one component is much wider than that of the other, the mother's education contributes about twice as much to the SES rating as does the person-to-room ratio. This seems to us a reasonable weighting, and the opinion is supported by the fact that it produces SES classifications which coincide with the subjective ratings of the families we know best. If the two components were equalized by weighting, several families in both EG and CG would be transferred to the "wrong" SES level.

When EG and CG are divided by SES level, a majority (60%) of EG fall within the lower SES classification and a majority (61%) of CG are classified as higher SES, a difference in proportion that is substantial although not statistically significant. For covenience the two levels will be referred to as "Low-SES" and "Hi-SES," although the families called "Hi-SES" are high only in relation to the families called "Lo-SES." In a broad, three-way classification of the nation's population, most of them would fall below the "Middle-SES."

	EG	CG
Hi-SES	12	40
Lo-SES	18	26

Analysis of census tract information and recent economic or demographic developments in the tracts involved offers no explanation of the subgroup differences between EG and CG. In lieu of explanation we resort to the salutary reflection that a broad control for income does not control effectively for socio-economic differences, especially within a low-income population, where relatively small dollar differences can substantially affect level of living.[23]

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[21] The size of IIQ-F is only 33, because two CG girls were not tested in 1964. Their scores in subsequent years ranged between 70 and 85.

[22] To obtain the SES rating for a family, person-to-room ratio was converted into a single number, dividing the numerator (number of people) by the denominator (number of rooms). Years of education for mother were used in reverse to correspond with person-to-room ratio, in which low number represents high desirability. Accordingly, 0 represents "more than high school education", 1 stands for completion of high school, 2 for eleventh grade, and so on. This number was added to the number representing person-to-room ratio. The resulting figure represents the SES rating of the family.

Again, the medians of EG and CG differed slightly in favor of CG and, as with IIQ, the mean of the two medians was accepted as the cutting point for the two groups.

[23] Herzog and Sudia, 1970.

TABLE 2

MEAN STANFORD-BINET SCORES, 1964 - 1969
(AS RELATED TO THE THREE PRIME VARIABLES)

	Experimental Group							Comparison Group							
	N°	1964	1965	1966	1967	1968	1969	1964	1965	1966	1967	1968	1969	N°	
Boys	14	76	90	97*	98	98	93	85*	87	89	93	94	90+	31	Boys
Girls	16	84+	91	96*	95	93	91	84	83	88	87	85	84	35	Girls
Hi-SES	12	82	94	96	105	99	97*	86	87	91	93	91	89	40	Hi-SES
Lo-SES	18	79	89	97*	91	93	89	82	83	84	86	85	84	26	Lo-SES
Hi-IIQ	13	91+	96	100*	99	98	96	91+	91	93	95	93	90+	42	Hi-IIQ
Lo-IIQ	17	73	87	94*	94	93	89	73	75	81	81	83	82	22	Lo-IIQ

° One EG child not tested in 1966; one to four CG children not tested in 1964, 1965, 1966 and 1968.

* t values of differences between EG and CG that are statistically significant:

	p .05		p .01	
1964	Boys,	2.84		
1966	Boys,	2.12	Lo-SES,	3.47
	Girls,	2.43	Hi-IIQ,	2.79
			Lo-IIQ,	3.43
1969	Hi-SES,	2.02		

+ t values of differences within EG and within CG that are statistically significant:

		p .05		p .01	
1964	EG	Girls-Boys,	2.25	Hi-IIQ - Lo-IIQ,	8.22
	CG			Hi-IIQ - Lo-IIQ,	10.18
1969	CG	Boys-Girls,	2.02	Hi-IIQ - Lo-IIQ,	2.95

For the sake of clarity, t values of differences between EG and CG are considered only for the years, 1964, 1966 and 1969; differences within EG and within CG are considered only for years 1964 and 1969.

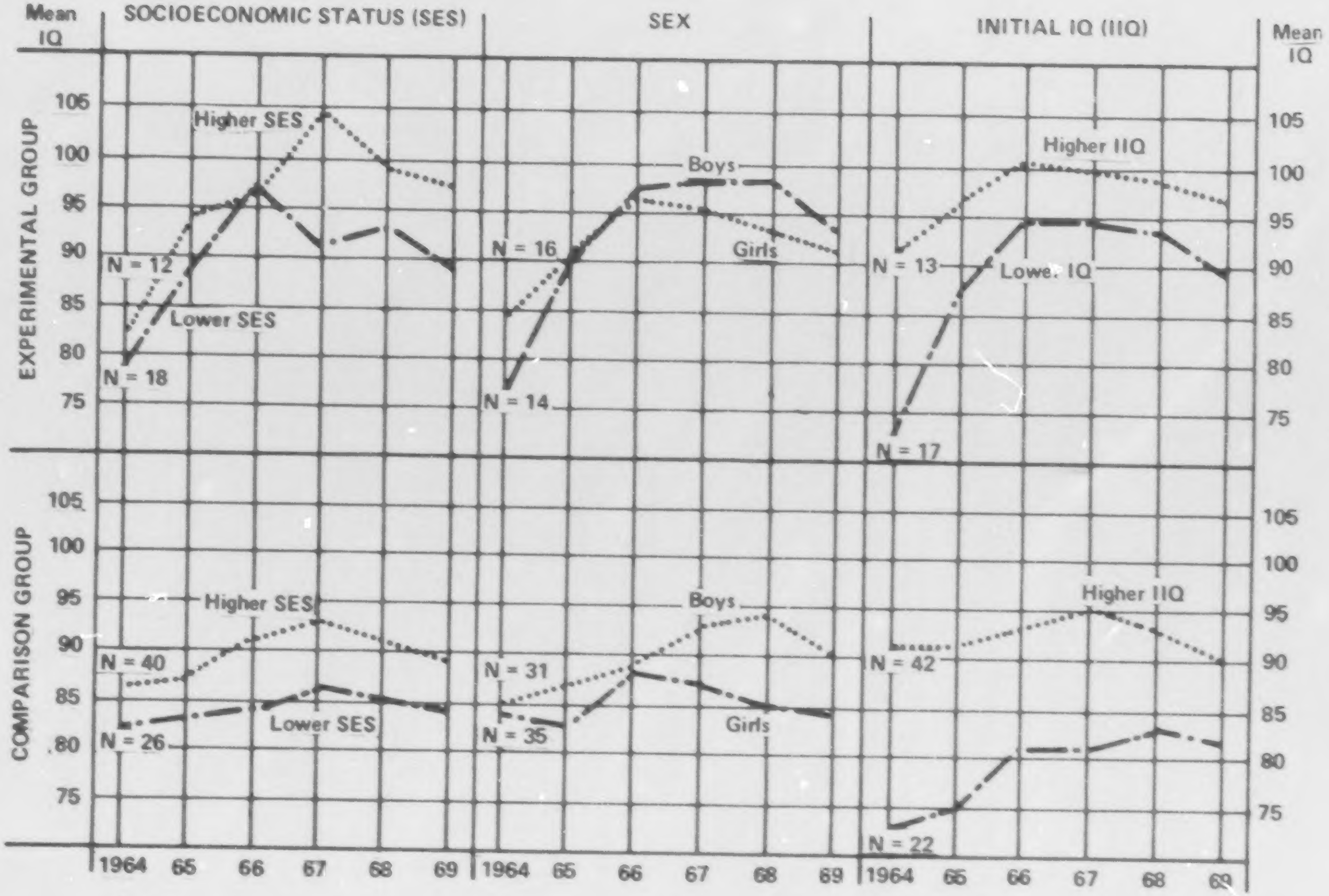

Figure 2. Mean Stanford-Binet Scores, 1964-1969 as related to the three prime variables

Subgroup variations

Figure 2 and Table 2 show the IQ scores of EG and CG as related to the three prime variables. In four of the six comparisons one subgroup remains consistently above the other; and in all six, one remains above the other after 1966. In each comparison also, the mean score of EG is higher than the mean score of the corresponding subgroup in CG. In 1966, at the end of the nursery school program, these differences are statistically significant for all the subgroups *except* the Hi-SES. In 1969, at the end of second grade, the difference is statistically significant *only* for the Hi-SES subgroups. The fading out of significance is obviously related to the decline in EG gains observed in the total group means, as well as in the subgroup curves.

At the end of nursery school (1966), the two SES levels in EG scored about the same. However, the Hi-SES children continued to gain during the kindergarten year (1967), while the Lo-SES children were losing. Thus, although the mean score of the Hi-SES declined sharply during the next two years, it showed no net loss between 1966 and 1969, while that of the Lo-SES children lost 8 points. Over the five year period (1964-1969), 8 of the 12 Hi-SES children (67%) showed a net gain of 15 or more points, while of the 18 Lo-SES children, only 5 (28%) showed that much net gain—a statistically significant difference (chi square = 5.2, df = 1, $p < .05$).

The timing of gains during the nursery school program (1964-1966) adds interest to the difference in 1969 levels between the SES subgroups in EG. The Hi-SES children made most of their mean IQ gains during the first year, while the gains of the Lo-SES were rather evenly divided between the two years. At the end of the second year, the investigators wondered whether the Hi-SES children would have benefited as much by a one-year as by a two-year program.[24] However, their continued gain during the kindergarten year argues against that speculation.

That the Hi-SES children, starting at nearly the same point, should gain substantially more than the Lo-SES, and retain more of their gains, is an unexpected difference in response to the program. That both Hi-SES and Lo-SES subgroups in CG had about the same mean scores in 1969 as in 1966 underlines the role of the program in emphasizing SES differences within EG.

Inter-relations among the three prime variables

The patterns that emerge when the three prime variables are related to each other demonstrate that each of the three is important in its own right, and also that their importance varies in different combinations.

The size of the numbers involved discourages efforts at simultaneous control of the three variables. It is feasible, however, to view them in pairs. When this is done, twelve subgrouplets result. These numbers also are very small, and few differences between or within EG and CG are statistically significant. However, the regularities are too consistent to be dismissed. Moreover, some patterns seen in the mean scores of the project tests are conspicuous also in those of the school achievement tests and in the proportions of children at or below grade level in 1970.

Full presentation of all the comparisons would exceed the limits of available space and reader tolerance. It is possible, however, to indicate a few outstanding features and to state a few proportions derived from detailed analysis, with some supporting evidence for each.

IIQ and SES. When IIQ is related to SES, some striking patterns of change in mean IQ scores result, as represented in Figure 3 and Table 3. Analogous patterns, apparent when sex is related to IIQ and SES, will be referred to but not presented graphically. (Table 3)

The most dramatic change pattern in Figure 3 is that of the Hi-SES-Lo-IIQ children in EG. Beginning within two points of the lowest mean scores for 1964, they rise to the highest mean (108) for any subgroup; and in 1969—despite the substantial decline shared with most of the others—they score slightly above all the others, including the Hi-SES-Hi-IIQ's.

It is noteworthy that the Hi-SES-Lo-IIQ group in CG is one of the two CG groups to gain most, although by no means as much as the corresponding group in EG. Despite the small numbers, the difference between both the scores and the net gains (1964-1969) of the Hi-SES-Lo-IIQ children in EG and CG is statistically significant in 1969 (for gains, $t = 2.23$, $p < .05$; for scores, see Table 3). Moreover, within EG, the difference between the mean scores of the Hi-SES and Lo-SES children classified as Lo-IIQ is also significant in 1969 ($t = 2.34$, $p < .05$).

Once again, the influence of SES is apparent in the differences within EG and CG; the influence of the program is suggested by differences between EG and CG.

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[24] Kraft et al., op. cit.

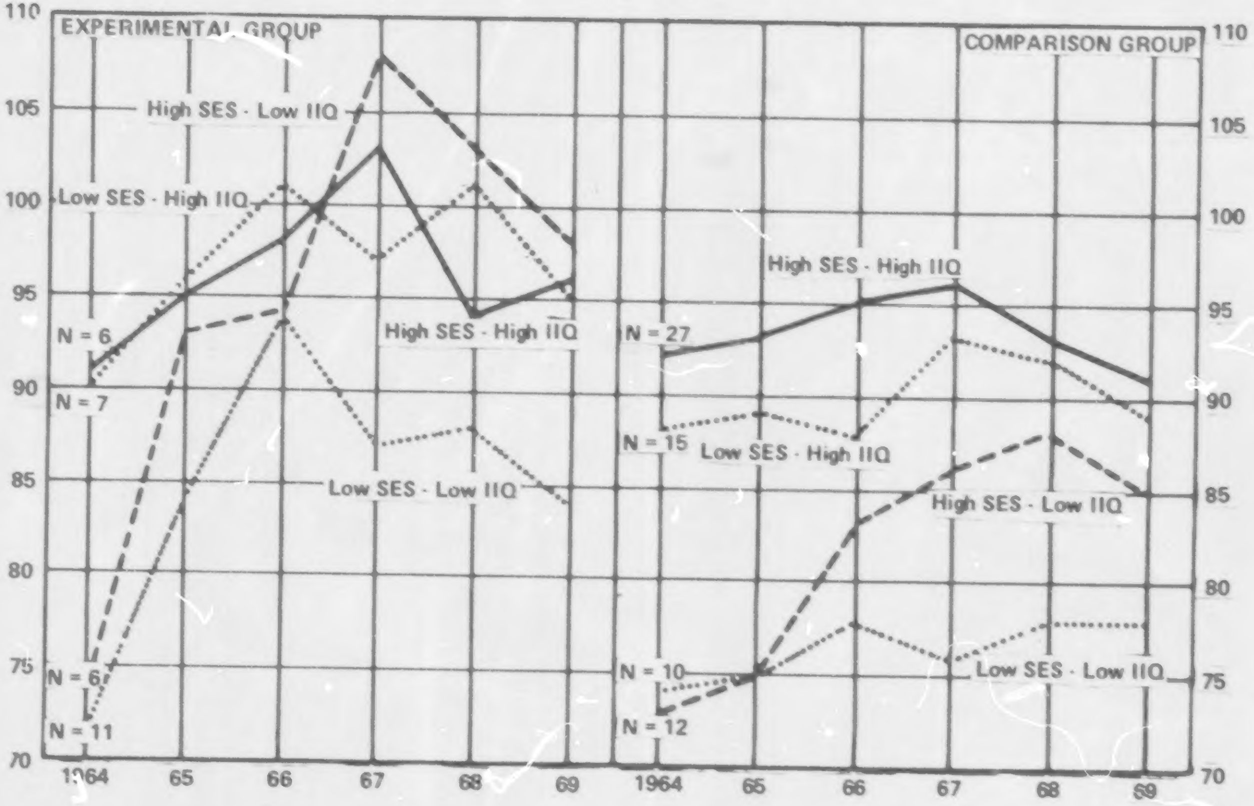

Figure 3. Mean Stanford-Binet Scores, 1964-1969 as related to Socioeconomic Status and Initial IQ

TABLE 3

MEAN STANFORD-BINET SCORES, 1964 - 1969
(AS RELATED TO SOCIO-ECONOMIC STATUS AND INITIAL IQ)

			Experimental Group						Comparison Group								
		N°	1964	1965	1966	1967	1968	1969	1964	1965	1966	1967	1968	1969	N°		
Hi-SES	Boys	7	77	93	94	106	102	95	85°	87	91	95	97	91	19	Hi-SES	Boys
	Girls	5	91	96	99	105	95	99*	88	86	91	90	86	87	21		Girls
Lo-SES	Boys	7	76	87	99*	90	94	91	87	88	86	90	89	88	12	Lo-SES	Boys
	Girls	11	82	89	94*	91	92	87	78	79	83	82	83	81	14		Girls
Hi-SES	Hi-IIQ	6	91	95	98	103	94	96	92	93	95	96	93	91	27	Hi-SES	Hi-IIQ
	Lo-IIQ	6	74	93	94*	108	103	98*	73	75	83	86	88	85	12		Lo-IIQ
Lo-SES	Hi-IIQ	7	90	96	101*	97	101	95	88	89	88	93	92	89	15	Lo-SES	Hi-IIQ
	Lo-IIQ	11	72	84	94*	87	88	84	74	75	78	76	78	78	10		Lo-IIQ
Hi-IIQ	Boys	4	87	94	99	95	97	92	92	93	93	97	98	92	20	Hi-IIQ	Boys
	Girls	9	93	97	100*	101	98	97	89	90	92	93	88	88	22		Girls
Lo-IIQ	Boys	10	72	89	96*	99	98	93	74	77	83	87	87	86	11	Lo-IIQ	Boys
	Girls	7	74	85	90	87	87	83	73	72	79	77	79	78	11		Girls

° One EG child not tested in 1966; one to four CG children not tested in 1964, 1965, 1966 and 1968.

* For t values of differences between EG and CG that are statistically significant at or beyond the .05 level, see text below.

For the sake of clarity, t values of differences between EG and CG are considered only for the years 1964, 1966 and 1969.

Mean Stanford-Binet Scores, 1964, 1966 and 1969: t values of differences between EG and CG that are statistically significant:

	p. 05			p .01		
1964	Hi-SES	Boys,	2.07	Lo-SES-Hi-IIQ,		4.30
				Lo-IIQ	Boys,	2.97
1966	Lo-SES	Boys,	2.30			
		Girls,	2.59			
	Hi-SES-Lo-IIQ,		2.53			
	Lo-SES-Lo-IIQ,		2.68			
	Hi-IIQ	Girls,	2.39			
1969	Hi-SES	Girls,	2.23			
	Hi-SES-Lo-IIQ,		2.49			

SES, IIQ, and Sex. The subgroup comparisons summarized in Table 3 include three sets of paired variables for EG and three for CG, with four means in each set. In 1969, in each of the EG sets, three of the four means were above 90 and one below, while in each of the CG sets three of the four were below 90 and one at or above 90. Although in some other respects the rank order differs for EG and CG, the lowest means, from 1965 on, are the same in both groups: Lo-SES-Lo-IIQ's, Lo-SES girls, Lo-IIQ girls.

School measures

In reporting on subgroup variations in the school measures, it will be expedient to consider both the six subgroups based on the three main variables and the twelve sub-subgroups derived by inter-relating these three, making a total of eighteen each, for EG and CG. For convenience, all will be referred to merely as subgroups, except where clarity requires differentiation.

All comparisons will be between or within EG and CG, and not with national norms for the school achievement tests. In general, both EG and CG—like other children in the inner-city schools of Washington, D.C.—scored below national norms for large cities.

MAT. The Metropolitan Achievement Test, administered near the end of the second grade year, includes one subtest in arithmetic and four in skills related to verbal ability. Except in arithmetic, comparison of mean scores for subgroups (as for the total groups) consistently favors EG (Table 4). On the arithmetic subtest, however, the majority of the comparisons favor CG, and one of these reaches statistical significance.

In the verbal, or "Reading," subtests of the MAT, the EG subgroups for the most part scored higher than the corresponding CG subgroups, and in fourteen of the comparisons their advantage reached statistical significance—four of them at the .01 level of significance despite the small numbers.

A count of this type obviously includes much duplication, since each of the three primary classifications—and each of the children within them—re-appears in a number of combinations. We view it as a useful comparison, nevertheless, since the same duplications occur for both EG and CG, and the variations help to indicate the relation of each component to response to the program.

CTBS. The Comprehensive Test of Basic Skills, administered early in the third grade year, includes three arithmetic subtests, an "Arithmetic Total," two reading subtests, and a "Reading Total." Although the total group means of EG and CG were very similar, a number of differences appeared in the mean scores for various subgroups, some favoring CG but more favoring EG (Table 4).

As in the MAT, EG performed less well in the sections related to number than in those related to verbal skills. The mean score comparisons in arithmetic favored EG more often than CG, but three of the comparisons favoring CG reached statistical significance. All three of these were in the one arithmetic subtest that fared far worse than in the two ("Arithmetic Concepts" and "Arithmetic Application") that involved the ability to read and understand.

In the two "Reading" subtests and the "Reading Total," the great majority of subgroup comparisons favored EG, five of these reaching statistical significance, and four others approaching it.

MAT and CTBS. A number of points emerge from subgroup analysis of both school achievement tests:

1. As compared with CG (though certainly not as compared with national norms), EG did relatively well in the tests of verbal skills and comprehension, but less well in the tests of number skills. Of the 15 statistically significant differences favoring EG, not one occurred in an arithmetic section of MAT or CTBS; and of the 4 statistically significant differences favoring CG, not one occurred in a verbal section.
2. The failure of EG to compare well on arithmetic tests may relate to the emphasis on verbal skills throughout the program, apparently at the expense of proficiency in arithmetic.
3. Among the six main subgroups, the mean scores of the Hi-IIQ's and Hi-SES's in EG for the most part were substantially higher than those of the Lo-subgroups within EG, and higher than those of their counterparts in CG. The Lo-SES's and Lo-IIQ's somewhat less often outscored, and occasionally averaged lower than, their counterparts in CG.
4. Although the main Hi-SES and Hi-IIQ subgroups tended to have relatively higher mean scores, and the Lo-IIQ and Lo-SES to have relatively lower

TABLE 4

SCHOOL ACHIEVEMENT TESTS

DIFFERENCES BETWEEN 1969 SUBGROUP MEANS OF EXPERIMENTAL AND COMPARISON GROUPS[1]

	Metropolitan Achievement Test					Comprehensive Test of Basic Skills						
							Reading		Arithmetic			
	Word Knowledge	Word Discrimination	Reading	Spelling	Arithmetic	Vocabulary	Comprehension	Total	Computation	Concepts	Application	Total
Hi-SES	•	•	~	•	=	—	—	—	—	—	—	—
Lo-SES	—	—	—	—	=	—	—	—	△	○	—	=
Hi-IIQ	—	—	—	~	=	=	=	=	○	=	—	—
Lo-IIQ	•	•	—	—	—	~	~	•	=	—	—	—
Boys	—	—	=	—	≈	—	—	—	=	=	—	—
Girls	•	—	—	—	=	~	=	—	=	—	—	=
Hi-SES Boys	—	—	—	—	=	=	—	=	—	—	—	—
Hi-SES Girls	••	•	~	••	—	—	—	—	—	—	—	—
Lo-SES Boys	—	—	—	—	=	—	—	—	=	—	—	—
Lo-SES Girls	—	—	—	—	=	—	—	—	△	=	—	=
Hi-SES Hi-IIQ	~	—	~	~	=	=	=	=	—	—	—	—
Hi-SES Lo-IIQ	~	••	•	••	—	—	~	•	=	—	—	—
Lo-SES Hi-IIQ	—	—	—	—	=	—	=	=	=	=	—	=
Lo-SES Lo-IIQ	—	—	—	—	—	—	—	—	=	—	—	—
Hi-IIQ Boys	=	—	=	—	△	=	=	=	=	=	—	=
Hi-IIQ Girls	•	~	—	•	—	—	=	=	—	—	—	—
Lo-IIQ Boys	—	—	—	—	—	—	—	—	=	—	—	—
Lo-IIQ Girls	—	~	—	—	=	—	•	••	△	—	—	=
Total	•	—	—	—	=	—	○	—	=	—	~	—

See following page for footnote

TABLE 4 (continued)
SCHOOL ACHIEVEMENT TESTS

LEGEND

Favoring EG	Differences	Favoring CG
–	Non-significant	=
~	Significant at .10 level	≈
*	Significant at .05 level	Δ
**	Significant at .01 level	ΔΔ
o	No difference between EG and CG	

FOOTNOTE

School Achievement Tests: t values of differences between EG and CG that are statistically significant at or beyond the .05 level:

	MAT Differences favoring EG
Hi-SES:	Word Knowledge, 2.37; Word Discrimination, 2.49; Spelling, 3.03
Lo-IIQ:	Word Knowledge, 2.51; Word Discrimination, 2.54
Girls:	Word Knowledge, 2.20
Hi-SES Girls:	Word Knowledge, 3.71; Word Discrimination, 2.17; Spelling, 3.44
Hi-SES–Lo-IIQ:	Word Discrimination, 3.53; Reading, 2.96; Spelling, 3.85
Hi-IIQ Girls:	Word Knowledge, 2.55; Spelling, 2.20
	MAT Differences favoring CG
Hi-IIQ Boys:	Arithmetic, 2.63
	CTBS Differences favoring EG
Lo-IIQ	Total Reading, 2.88
Hi-SES-Lo-IIQ:	Total Reading, 2.52
Lo-IIQ Girls:	Reading Comprehension, 2.42, Total Reading, 3.55
	CTBS Differences favoring CG
Lo-SES	Arithmetic Computation, 2.09
Lo-SES Girls:	Arithmetic Computation, 2.25
Lo-IIQ Girls:	Arithmetic Computation, 3.14

ones, the Hi-SES-Lo-IIQ sub-subgroup in EG outshone all others in the school achievement as well as in the project tests. Their mean scores were either the highest or near to the highest in all verbal and arithmetic subgroup comparisons, except for "Arithmetic Computation." They were involved in four of the statistically significant differences favoring EG, and two more that approached significance.

5. The EG girls, on the other hand, provide the main example of contrast between patterns in the project and achievement tests. Their scores on the school achievement tests compared more favorably with those of the EG boys than might have been expected from project test results. The higher mean scores of the girls are in line with the general expectation that little girls will do better in school than little boys. However, the contrast between the school achievement tests and the project tests in this respect invites speculation about the differing response of little girls and little boys to the school situation. Possibly the boys, more than the girls, missed the individualized response they had

received both in the earlier program and in the project test situation.

6. The CG girls were less likely than the EG girls to compare favorably with the boys in CG on mean scores in the school achievement tests—a difference not in line with the general expectation just mentioned.

Grade Placement. Subgroup differences between EG and CG in the proportion of children at or below grade level at the beginning of the fourth grade year are also more striking than the differences for the total group, although only one comparison reaches statistical significance (Table 5). In all except one, the proportion of children at the expected grade level was higher for EG than for CG. The exception was that the proportion of CG girls was very slightly higher than the proportion of EG girls (Table 5). Recurrent subgroup differences suggest that the advantage of CG in this instance relates to the fact that in EG there are twice as many Lo-SES as Hi-SES girls, while in CG the Hi-SES girls outnumber the Lo-SES girls by three to two.

Although it is often desirable to emphasize the positive, in this case the dramatic facts call for a negative statement. It is horrifying to see that over two-thirds of the CG boys are below grade level, and that a little over one-third of the EG boys are below. It is hardly more cheering to find that half of the Lo-SES children in EG are already below grade level, after only one year in regular school classes, and that nearly two-thirds of the Lo-SES children in CG are below grade level. If one considers the effects of the preschool program, the proportions are far too similar for comfort. And if one considers the children, without regard to the program, comfort is non-existent.

TABLE 5

GRADE PLACEMENT DURING FOURTH GRADE YEAR, 1970 - 71

	N		Percent in 4th Grade		Percent below 4th Grade	
	EG	CG	EG	CG	EG	CG
Total	30	66	67	53	33	47
Boys	14	31	64	32	36	68
Girls	16	35	69	71+	31	29
Hi-SES	12	40	92+	65+	8	35
Lo-SES	18	26	50	35	50	65
Hi-IIQ	13	42	85	60	15	40
Lo-IIQ	17	24	53	42	47	58
Hi-SES &/or Hi-IIQ	19	55	84*+	56	16	44
Lo-SES/Lo-IIQ	11	11	36	36	64	64

+ Differences within EG and within CG that are statistically significant:

EG: Hi-SES—Lo-SES, chi square = 5.62, df = 1, $p < .05$
Hi-SES &/or Hi-IIQ—Lo-SES & Lo-IIQ, chi square = 5.73, df = 1, $p < .05$

CG: Girls—Boys, chi square = 8.79, df = 1, $p < .01$

* Differences between EG and CG that are statistically significant:

HI-SES &/or Hi-IIQ—Lo-SES & Lo-IIQ, chi square = 4.88, df = 1, $p < .05$

In line with differences in scores on the project and school achievement tests, only one Hi-SES child (a boy) in EG and only two Hi-IIQ children (both boys) are below grade level, while 92% of the Hi-SES and 85% of the Hi-IIQ children are at grade level. Although the percentages in CG are lower, a significantly larger proportion of Hi-SES and Hi-IIQ than of Lo-SES and Lo-IIQ children are at grade level.

One of the most striking grade placement differences is the much larger proportion of EG than of CG boys who are at grade level, a proportion much like that of the EG girls—which is contrary to usual expectations. One would like to believe that it shows the effects of the program, and that the program counteracted somewhat the tendency of little boys to regard school and learning as "sissy" affairs.

On the whole, the non-promoted children in both EG and CG were likely to score below the groups means on the project and school achievement tests. However, four of the five non-promoted boys in EG scored substantially above the group means on the Stanford-Binet, and also above the mean for the promoted boys, suggesting that the school performance of this small group was definitely below their capacity.

Sex differences in scores

When all the boys in EG or CG are compared with all the girls, as in Figure 2, the mean IQ score of the boys is regularly above that of the girls. However, when the sexes are also classified by IIQ, the mean score of the Hi-IIQ girls in EG remains consistently above that of the boys, except for a near-convergence in 1968. (See Table 3). Moreover, in a number of the subgroup comparisons for the school achievement tests, the girls outscored the boys—twice as often in EG as in CG.[25]

Analysis of the various subgroup means has led to the speculation that the initial scores for the girls reflected their potential test and school performance more accurately than the initial means for the boys reflected theirs. For example, at first it seemed an unfortunate coincidence that the Hi-SES-Lo-IIQ subgroups in both EG and CG were predominantly boys (5 out of 6 in EG and 9 out of 12 in CG). Further analysis suggested that this imbalance was no accident. On the average, the Hi-IIQ girls tended to remain above the group mean and the Lo-IIQ girls to remain below it. Among the boys, however, the Lo-IIQ's in both EG and CG—but especially in EG—were as likely to move above the group mean in subsequent years as to remain below it. And if the Lo-IIQ boys were also Hi-SES, they were much more likely to rise above the group mean.

This impression is reinforced by several additional points evident in the Stanford-Binet IQ scores: in 1964 the differences between the mean scores of the Hi -and Lo-IIQ's were statistically significant for both the boys and girls, within EG and within CG, and in 1969 the difference was significant for the girls in both groups but not for the boys in either group;[26] the correlation between the 1964 and 1969 means was higher for the girls than for the boys (.55 for the girls as compared with .23 for the boys in EG, and .61 for the girls as compared with .47 for the boys in CG); in 1969, the mean score for the Lo-IIQ girls in EG was below 90, while for the other three sex-IIQ subgroups the means were above 90. Also, the Hi-IIQ girls in EG surpassed the Hi-IIQ boys in EG on every school achievement test.

The greater dependability of initial IQ scores for girls than for boys could reflect the greater docility and readiness to cooperate of little girls, or perhaps a greater maturity at age three. The ratings and comments of the testers in the initial (1964) testing sessions give repeated evidence that the boys in EG and CG often failed either to understand or to cooperate. Whatever the explanation, however, this is a finding to be reckoned with in any comparisons of gains or before-and-after scores, especially when the subjects are very young children.

The "Hi's" and the "Lo's"

Analysis brings out a point that common sense might deduce: a Hi-IIQ is likely to be more reliable predictive of future test performance than a Lo-IIQ. Poor motivation or cooperation can easily result in a person not doing his best in an initial test, but good motivation or cooperation would be less likely to make him do better than his best.

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[25] Two earlier studies of Negro children in low-income families found the boys doing better than the girls in tests of IQ and language development. (Anastasi, 1952; Brown, 1944). However, on the whole, relevant findings are not solid or consistent. A difference in favor of the boys has been found often enough to argue against dismissing it as an idiosyncracy of the sample and seldom enough to call for further exploration.

[26] EG: 1964 - Hi-IIQ Boys-Lo-IIQ Boys, $t = 4.79$, $p < .001$
Hi-IIQ Girls-Lo-IIQ Girls, $t = 6.70$, $p < .001$
1969 - Hi-IIQ Girls-Lo-IIQ Girls, $t = 2.43$, $p < .05$
CG: 1964 - Hi-IIQ Boys-Lo-IIQ Boys, $t = 6.80$, $p < .001$
Hi-IIQ Girls-Lo-IIQ Girls, $t = 7.58$, $p < .001$
1969 - Hi-IIQ Girls-Lo-IIQ Girls, $t = 2.80$, $p < .01$

The subgroup means have already demonstrated the dramatic gains in mean IQ scores of the Hi-SES-Lo-IIQ children; and about half of the Lo-SES-Lo-IIQ boys also gained substantially. Inspection of individual scores shows further that, among the 13 Hi-IIQ children in EG, only one dropped lower than the initial mean score for EG as a whole, while among the 17 Lo-IIQ's, 13 rose above it. That is, Hi-IIQ's were more likely than not to rise above it. Remaining below it, in turn, was related both to sex and to SES level. This observation cannot be dismissed as involving merely regression to the mean, since it suggests which children are more and which less likely to gain substantially. Analysis indicates further that an initial assignment to the higher classification, either in IIQ or in SES, was associated with relatively high scores in both project and achievement tests in 1969.

Repeated instances have led to the generalization that a "Hi-" rating in either SES or IIQ appears to be "dominant" and a "Lo-" recessive, in the sense that a Hi-classification tends to win out over a Lo- one. In most of the measures used, the subgroups classified as Hi- in *either* SES or IIQ are likely to resemble those rated Hi- in *both* more than they resemble those rated Lo- in both.

The generalization receives support from the grade level status at the close of the third grade year. Of the children rated Hi- in SES and/or IIQ, 84% in EG were at or above grade level as they began the fourth grade year, as compared with 16% below grade level; in CG the corresponding figures are 56% and 44%. That the differences are more marked in EG than in CG presumably relates to SES influence on response to the program. Program effects are also suggested by the statistically significant advantage of EG over CG in the proportion of Hi-SES and/or Hi-IIQ children who were at grade level. No such difference appeared, however, in the proportions of "Lo-Lo's" for EG and CG. On the contrary, both the numbers and proportions of "Lo-Lo's" for EG and CG were identical for the two groups: 7 out of 11 children (64%) classified as "Lo-Lo" were below grade level. The identical number of Lo-Lo's in two groups of such disparate size is yet another reminder that groups apparently matched on demographic variables are not necessarily matched on elements essential to evaluating a preschool program. (See Table 5.)

Implications for Program

With regard to the program, two conclusions seem inescapable: (1) the experimental group did not benefit as much as had been hoped; (2) the "Hi-SES" children (e.g. the less poor), who resembled the middle class more than did the "Lo-SES", were the ones who benefited most.

(1) That the mean scores of total EG and five of its six primary subgroups were significantly above those of CG in 1966 and—with few exceptions—were not significantly higher in 1969, either in the Stanford-Binet or the school achievement tests, demonstrates that the program was not enough to protect EG from the "cumulative academic retardation" reported again and again for inner-city children.[27] (See Tables 2 and 4.)

The decline might conceivably be attributed to limited ability on the part of the children, to the nature of the tests, to characteristics of the public school situation, or to all of these. That the chief cause lies in the limitations of the children seems unlikely in view of reported school successes with similar children.[28] Such reports are limited in number, but frequent enough and convincing enough to persuade us that the children can learn how to learn if we can learn how to teach them. We view the failure of EG to maintain initial gains more as a challenge to our educational effort than as a reflection on the potential competence of the children.

It is possible, of course, that by the time the EG children reach fifth or sixth grade they will show a more impressive advantage over those who did not have a five-year enrichment program. It is also possible—and perhaps more likely—that they will have lost any remaining advantage, or will retain a negligible amount.

Our experience in the program as a whole (including home visits, school observations, and interviews with parents and teachers) has convinced us: that a young preschool program can enhance the school readiness of children; that for black inner-city children such a program probably requires more specialized curriculum and teacher training than the traditional nursery school usually affords; and that probably even the most effective preschool program cannot provide enough cognitive and motivational support to enable inner-city children to reach their academic potential in our public school system as it prevails today.

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[27] Clark, op. cit.; Kennedy et al., op. cit.; Osborne, op. cit.; St. John, op. cit.

[28] Clark, 1970; Silberman, 1970.

This does not imply that changes in the public schools, however drastic, would suffice in themselves. Six years of experience with this project have brought home with ever-increasing force the important role of adequate food, sleep, clothing, and housing in a child's ability to learn. Family stresses are no less important, but they are less directly amenable to constructive intervention, and the meeting of subsistence needs could help both in reducing family stress and increasing the ability to cope with it.

(2) The differences in the response of Hi-SES and Lo-SES children to the program seem to us the most challenging element in our findings, for programs and also for program evaluation. The children who were closer to the middle-class orientation tended to reach higher IQ levels and to retain more of their gains, and showed similar advantage in school achievement tests and grade placements. The Lo-SES children in EG achieved somewhat better than the Lo-SES in CG on most project and achievement tests, but not in actual grade placement or in number skills. Nor were their gains commensurate with their academic needs, with program expectations, or with the gains of the Hi-SES.

On the whole, the SES differences within EG became more marked than those within CG, suggesting that the influence of SES is strengthened by exposure to an enrichment program. This indication, along with all the other SES differences observed, raises a question about the appropriate target groups for preschool enrichment programs. The question could be answered in several ways.

It could be concluded that available resources should be focused mainly on the children classified as "Lo-SES"–those who are socio-economically the most deprived. This view would hold that, since their needs are greatest, in simple fairness the resources available for preschool enrichment programs should be expended mainly on the Lo-SES. It has often been assumed also that those who begin at the lowest levels of test performance and school achievement have most to gain, and therefore will gain most, from enrichment programs. Our findings give only partial support to this view, since the gains of those with initially low IQ were so strongly associated with socio-economic classification. Nevertheless, it could be argued that the major effort should be directed to improving the school performance of those children who begin with the double disadvantage of very low IQ and very low SES.

On the other hand, it could be concluded that our limited resources should be focused on the children classified as "Hi-SES". They are the ones who respond most constructively to the kinds of programs we could most readily conduct on a large scale. If we help the most helpable, in this view, we can most quickly and effectively help the largest number of children, gradually reducing the size of the target group. Meanwhile, continuing investigation can discover more effective ways of helping the smaller remaining group that responds less to the kinds of programs offered today.

A further argument for focusing on the "Hi-SES's" lies in the "ripple effect". Interest in learning, and ability to learn, are to some extent contagious, as has been observed in the effects on siblings of successful preschool programs.[29] The children who are helped to enhanced school achievement will influence those with whom they are in contact, so that some of their gains will "rub off" on others.

A third conclusion would be that no effort should be made to focus on either the Hi-SES or the Lo-SES, and this is the conclusion to which we lean. Perhaps it is based in part on a culture-bound revulsion against officially endorsed and enforced ("*de jure*") class discrimination. But it is supported by several kinds of evidence: research evidence that SES segregation can be as unfavorable and undesirable as racial segregation;[30] experience indicating that a tract system is counterproductive for children assigned to the lowest tract and possibly for those assigned to higher ones; evidence that a child's self-concept can affect his academic performance for better or for worse; evidence that the expectations of others can affect his academic performance for better or for worse.[31]

We would favor programs desegregated economically and ethnically, including white and non-white children, poor and non-poor, to the greatest extent feasible. We would not establish quotas to accomplish this end or attempt to import children from one neighborhood into another in order to achieve socio-economic balance. We would merely locate preschool enrichment programs in poverty areas and open them to all applicants, neither encouraging nor discouraging any socio-economic or ethnic groups. If the programs are of high quality, some middle-class parents will probably want to enroll their children, as happened, for example, in the Rochester schools.[32] In any case, the neighborhood is likely to provide enough socio-economic mix for a good beginning.

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[29] Gray and Klaus, 1969.

[30] St. John, 1969.

[31] Clark, 1965; Rosenthal and Jacobson, 1963.

Teaching methods and SES. The findings on SES differences, combined with the message of total EG performance and grade placement, we interpret to mean that teaching methods in preschool enrichment programs should be different from those employed in our project. Just what changes should be introduced is a question not addressed by our data, which reveal only that the teaching styles of the traditional middle-class nursery school are apparently not well adapted to the learning styles of most children from the very poorest families, and possibly of some who are less poor. It may be argued that a more excellent program of its kind would have had more encouraging results. But, whatever the reservations about the specific program EG experienced, it was probably as excellent as any of its kind as could be developed on a large scale. And, though we believe, and their parents seem to believe, that children are better off with the program than they would have been without it, we do not see its results as meeting the need.

An approach more effective for the Lo-Lo's might well prove more effective also for some of the Hi-SES and Hi-IQ's, and for some who are higher SES than any in this program. Such an approach would need to profit by the greater amount of research that has been done in this area, including research relating to language differences. It would also need to include scope and competence on the part of the teaching staff, and enough flexibility to allow for modification of teaching methods to suit the special needs of individual children. It would require opportunity for special work with very small groups of children, or with individual children. This was, in fact, done with EG throughout the project with enough profit to indicate its value but under circumstances that prevented realizing its full value.

Such an approach clearly demands a low teacher-child ratio and a schedule that allows for staff meetings and conferences with parents. A continuing problem in our project was the excessive burden placed on the time and energies of the teachers. Several who had long experience teaching in middle-class nursery schools told us during their exit interviews that before the project began they had no idea how much more demanding and exhausting it would be to work with children less "privileged" than the ones they were accustomed to teaching.

If we had it to do over. Aside from questions of teaching method and heterogeneity of the experimental group, a number of modifications would have been desirable in the program as originally conceived. If we were now to design a project similar in purpose, taking into account what we have learned from this one, we would try to make additional changes. Some of them we did attempt, but we would try even harder to have:

- More effective development of verbal skills, with more individual interchange of conversation between teachers and children.
- More emphasis on number skills during kindergarten and first grade.
- Fewer, more consistently present, and better trained nursery school aides; more, and better trained, kindergarten and primary school aides.
- More carefully planned and conducted introduction of the program into the public school system, to provide teacher orientation for the difficult assignment of communicating and interacting with very low SES parents and children, and to improve acceptance of such a project by the school staff.
- More effective promotion of teacher-parent communication during the primary grades. The staff social worker experienced some difficulty in persuading the primary school teachers that it would be helpful to listen to her reports about the home situations of the children. Finally, toward the end of the year, they understood what she was trying to make clear to them and exclaimed reproachfully, "Why didn't you tell us all this before?"
- Fewer changes of school setting for the program.

Program features that we would definitely want to retain include well-trained nursery school teachers, an experienced, competent, and humanly responsive social worker on the staff, transportation, provision of nourishing breakfast, lunch, and snacks, appropriate rest periods, adequate space and facilities, and a benign though clearly structured school environment.

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[32] Gross, 1970.

Implications for Program Evaluation

Comments concerning program evaluation are based on the assumption that the primary purpose of evaluating a preschool enrichment program should be diagnostic rather than actuarial. A country that has so often proclaimed commitment to the welfare of its children, including their education, and has had the benefit of evidence pointing again and again to the importance of the early childhood years in an individual's development, has no further need to inquire whether it "pays" to conduct preschool enrichment programs—especially if it is also the richest country in the world. The need is, rather, to discover what kinds of methods help what kinds of children, as one step toward learning how to help more children and how to help children more.

The importance of subgroups. The subgroup patterns and differences that have been reviewed, along with others not detailed here, provide basis for several generalizations relevant to evaluation of preschool enrichment programs:

- Since SES level *within* a low-income group strongly influences response to a preschool enrichment program, and since proportions of Hi-SES and Lo-SES children are likely to vary even between groups roughly matched on demographic variables, a fruitful evaluation must control for with-in-group SES variations.
- Since patterns of change in IQ score and also patterns of school achievement test scores show substantial differences between boys and girls, a fruitful evaluation must include analysis of sex differences in test scores and school measures.
- Since a good many initial test scores are likely to be spuriously low, especially for preschool boys, a fruitful evaluation cannot depend only on comparisons of IQ points gained over a given period; it must compare change patterns over time and final levels of test scores and school grade placement, taking into account (though not depending mainly upon) initial scores and performance.
- Since the test scores of individual children vary from session to session, sometimes radically, it is desirable to obtain a series of scores on a battery of tests, over a period of years, as a basis for assessing children's performance.

Evaluative measures

Since intelligence and achievement test results are subject to a number of serious doubts, and even grade placement may be an uncertain measure of school performance, evaluation of a preschool program requires more satisfactory measures in order to be fully convincing and fruitful. Among the possibilities are teacher ratings of children, standard and systematically kept report cards, systematic observations of children, and in-depth interviews with teachers and parents.

The present evaluation has included efforts to use all of these although it has not been possible to include all in an abridged report. Their exclusion here, in favor of standardized tests, reflects to some degree our own dissatisfaction with their evaluative contribution—in other words, dissatisfaction with the way we have used them. Nevertheless, we remain convinced that standardized tests alone are not enough for a fully satisfactory evaluation. Moreover, we suspect that to be fully fruitful an evaluation must include qualitative and descriptive material as well as quantified findings.

We believe that when more satisfactory methods of evaluating preschool enrichment programs are achieved, they will include the kinds of materials just indicated, as well as adequate analysis of subgroup variations.

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CHAPTER 6.

THE KARNES' PRESCHOOL PROGRAM: RATIONALE, CURRICULA OFFERINGS, AND FOLLOW-UP DATA

Merle B. Karnes, R. Reid Zehrbach, and James A. Teska

In a series of preschool studies conducted at the University of Illinois, Urbana-Champaign Campus, over the last five years, a highly structured, cognitive based curriculum was developed by Karnes and her associates. A comparison of the characteristics of children from low-income families with the experiences provided by the traditional preschool program revealed the necessity for developing a curriculum that would more appropriately meet the needs of these children. Toward this end, a curriculum was developed for 3-, 4-, and 5-year-old children from low-income families, both black and white.

Briefly, the curriculum is designed to be implemented in classes of 15 to 18 children taught by three adults functioning under close supervision. Within the classroom children are divided into small groups of 5 to 7 each. These groups provide a setting in which a variety of processes and concepts are taught and practiced in a game format under the teacher's direction. The daily schedule typically includes at least three structured learning periods—language, science or social studies, and mathematics—of twenty minutes each, along with large group activities—music and movement, art, and directed play. Snack time, lunch, and field trips are all viewed as settings which offer opportunities to foster language development and reinforce learnings.

Basic to the understanding of the curriculum (which will be discussed later) is an understanding of the rationale and assumptions upon which the curriculum was developed. The overriding goal is to prepare children from low-income families for participation in a standard school program.[2] Subsumed under this goal are eight subgoals:

1. To enhance cognitive development with particular prominence given to the development of language.
2. To develop motivation conducive to learning.
3. To acquire effective information-processing skills.
4. To develop a positive self-concept.
5. To enhance social and emotional development.
6. To promote motor skill development.
7. To assure parental participation.
8. To enhance staff competencies.

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[1] Dr. Karnes is professor of special education in the Institute for Research on Exceptional Children, Dr. Zehrbach is associate professor of special education, and Dr. Teska is assistant professor of special education. The research data in this study were partially supported by the U.S. Office of Education, Bureau of Research, Grant No. 5-1181.

[2] The conceptualization of the assumptions for the curriculum are presented in detail in *The Conceptualization of the Ameliorative Curriculum*, a paper presented at spring conference, "Conceptualizations of Preschool Curricula," May 22-24, 1970, The City University of New York, Division of Teacher Education, Center for Advanced Study in Education, New York City.

A review of the goals reveals that many of them, especially for the preschool child, are concerned with development which implies growth and change rather than the attainment of a static state. Thus, it is necessary to be more concerned with process than content. Process in this instance refers to the ability to obtain, organize, manipulate, synthesize, integrate, and communicate information while content refers to facts, information, and concepts.

To help the teacher understand and direct her teaching toward process goals, two models, the Psycholinguistic Model (1961) and the Structure of the Intellect Model (1967), were selected. These models have proven useful to teachers because of the practical way in which they systematize the understanding basic to communication and thinking processes. The models were also selected because of the ease with which they complement each other.

The content of the curriculum was selected as a result of the review of the literature, examination of curriculum guides and instructional materials, and practice. Selection of content was based on the following guidelines:

1. Frequency of occurrence of content in sources examined.
2. Information that can be organized to form a logical category.
3. Information that organizes into a logical sequence.
4. Information that encourages generalization and transfer.
5. Feasibility of providing concrete experiences.
6. Relevancy to the immediate community.
7. Interest and background of teachers.
8. Staff knowledge of the child's strengths and weaknesses in content areas.

In addition to the structure provided by the use of models and goals, other guiding principles derived from the literature of psychology and education have been identified and incorporated into the curriculum. Some of the most important include: (1) behavioral objectives and criterion tasks, (2) carefully structured procedures, (3) belief in the individual worth of each child, (4) teacher enhancement, and (5) parental involvement. The area in the Karnes' Preschool Curriculum that is the most easily overlooked and yet one which is of prime importance is that of enhancement of the affective development of the children. The development of a positive self-concept is considered to be of paramount importance. Its importance is underscored by such actions as the careful attention given to selecting activities that are challenging, but not frustratingly difficult for children. Thus, no one section of the curriculum has been identified as the "affective" section because it is basic to all sections.

The joy of learning and living and working together with peers and adults is reflected in the happy faces of the children in the Karnes' program. Teachers, too, are happy because they understand the goals and how to flexibly proceed toward accomplishing these goals.

Similarly, social competency is an undergirding concept of the curriculum. Children who are happy with themselves can express their happiness as they work with others. Children engaged in joint productive efforts are in an excellent position to learn appropriate social skills. Again, the indicated low teacher-pupil ratio is a basic component of the program because it establishes a setting wherein the teacher can provide immediate positive reinforcement for appropriate social, emotional, and cognitive behavior.

The preceding discussion has described the basic rationale for the curriculum. The following section provides a brief discussion of the components of the curriculum.

The Karnes' curriculum for 3–5-year-old children has eight components: (1) Science, (2) Mathematics, (3) Social Studies, (4) Language, (5) Art, (6) Directed Play, (7) Music and Movement, and (8) Creative and Productive Thinking (Guilford Activities). The activities in these areas are presented in the form of sequential model lesson plans which include specific behavioral objectives and criterion tasks.

The *Science* component of the curriculum offers children a variety of experiences in areas generally considered basic to the science offerings of the elementary school classroom. A major goal of this portion of the curriculum is to help the preschool child become increasingly aware of his environment in relation to himself and, therefore, those areas which comprise his environment—air, water, sound, light, animals, weather, plants—are included. Each child will acquire essential skills of observation and a vocabulary which will assist him in making further observations, asking questions, and expanding his knowledge of his environment.

The *Mathematics* facet of the curriculum is designed to help the child acquire factual knowledge and, as is true of all other components of the curriculum, affective behavior and language development are fostered. The curriculum is divided into pre-number units—Geometric Figures, Sets and One-to-One Matching, Ordering, and Dimensional Terms—which provide the basic understandings prerequisite to number and numerals.

The *Social Studies* is designed to introduce the child to himself. It helps him answer the question, "Who Am I?" The curriculum leads the child step by step from that which should be most familiar to him—himself—to his most immediate environment—his family and home—and, finally, to the more complex world of interaction outside his home—the community. Through the use of this curriculum, the child becomes more aware of himself as a unique individual and as a valuable group member; in addition, he becomes cognizant of the important roles others play in his life. The fourteen units covered in this area of the curriculum are: (1) Self-Concept, (2) Body Parts, (3) Function of Body Parts, (4) Clothing, (5) Emotions, (6) Attitudes of Behavior, (7) The Family, (8) The Home, (9) Pets, (10) Communication, (11) Community Workers, (12) Transportation, (13) Buildings, and (14) The City.

While language development is one of the primary goals of the program and is stressed throughout the day, a portion of each day is specifically devoted to fostering improved language. The lesson plans included in the *Language Processing* curriculum are classified under subheadings derived from the clinical model of the *Illinois Test of Psycholinguistic Abilities*. These areas are: (1) Auditory Reception, (2) Visual Reception, (3) Verbal Expression, (4) Manual Expression, (5) Auditory Sequential Memory, (6) Visual Sequential Memory, (7) Grammatic Closure, (8) Auditory Association, (9) Visual Association, (10) Visual Closure, (11) Auditory Closure, and (12) Sound Blending. These lesson plans may be used to foster continued language development in all facets of language. They are, however, especially designed to help children ameliorate specific weaknesses in areas where the child manifests a weakness. While the results of an ITPA evaluation are especially useful in delineating strengths and weaknesses of a given child, in the absence of test results, areas requiring remediation may be identified by the teacher following an observation schedule.

The *Art* curriculum is designed to assist the teacher in creating an environment conducive to the general growth and development of young children. Further, the preschool art activities necessarily provide opportunities to develop many skills and behaviors requisite for later school success. Each child is encouraged through the use of a variety of art media to progress at his own rate through the developmental stages of children's art—the manipulative stage, the symbolic stage, and the pictorial stage.

Directed Play periods are felt to be an integral part of the curriculum. Play which is conducive to promoting the growth of the child is facilitated by careful planning on the part of the teacher. It provides a developmental base for the total child—intellectually, physically, socially, and emotionally. Through play both affective and cognitive processes can be supported. The young child can be helped to develop desirable attitudes, motivation, skills, and a sense of competence necessary for later success. In the current push for academic gains and cognitive development, the affective domain too often takes a secondary role. The rationale for this area of the curriculum is to emphasize the value and importance of both areas, and present positive methods for utilizing play to achieve these goals.

The Music and Movement areas of the curriculum provide opportunities for the child to explore concepts and participate in experiences which promote an appreciation of music. The movement aspect of the program seeks to further enhance the cognitive and affective development of the child, using a more creative approach through spontaneous participation. The body is the agent or instrument of movement. This curriculum does not require that the teacher have special training in music. With enthusiasm and careful planning, the teacher can help each child develop in the following important areas: (1) language, (2) listening skills, (3) body awareness, and (4) social competency.

The Creative and Productive Thinking activities included in the curriculum follow the instructional model derived from Guilford's Structure of the Intellect and thus are referred to as *Guilford Activities*. This area of the curriculum is designed to promote the development of each child in all phases of intellectual functioning. Logical, critical, and productive thinking are stressed in this facet of the curriculum. The three dimensions of the instructional model are *Operations, Content*, and *Products*. When the teacher has learned the three dimensions, he is able to think of each activity according to the process, content, and operations required by that activity.

METHODOLOGY

Longitudinal data have been gathered on two preschool intervention programs for children from low-income families. One approach, the Karnes' Preschool Program, used the curriculum based on the concepts presented earlier, while the other was a Traditional preschool program.

The major goals of the Traditional program were to promote the personal, social, motor, and general language development of the children. Teachers were instructed to capitalize on opportunities for incidental and informal learning, to encourage the children to talk and to ask questions, to stimulate their interest in the world around them. Special efforts were made to interest the children in books. Music, story, and art activities were scheduled regularly each week. Outdoor play on appropriate equipment was a part of the daily routine when weather permitted. Indoor play focused on a doll and housekeeping center, a vehicle and block center, and a small toy center. Juice time, rest period, show and tell, and the routine supervision of toileting and outdoor wraps completed the daily schedule.

Data were collected on 60 four-year-old children who were assigned to one of four classes, of 15 each, on a stratified basis such that the sex, race, IQ, and ages of the children in the classrooms were comparable. Two of the classes received the Karnes' curriculum and the other two received the Traditional curriculum. All variables that are typically considered to make a difference, such as teacher-pupil ratio (1:5), physical facilities, training of teachers, length of school day (2 hours 15 minutes), psychological examiners, setting of evaluation, medical examinations and nutrition were included.

Analysis of these S-B data is presented in Tables 1, 2, and 3. As will be seen by examination of Table 2, there was a significant difference among the means for tests. Further, the F for Groups approaches significance. As a result, it was deemed appropriate to ascertain where the differences might reside to clarify interpretation of the data. Results of the Newman-Keuls Procedure presented in Table 3 can be summarized as follows:

1. At Test 1, the two groups were not significantly different from each other.
2. Both groups were significantly higher at Test 2 than they had been at Test 1.
3. At Tests 2 and 3, the Karnes' group was significantly higher than the Traditional group.
4. At Tests 4, 5, and 6, the two groups did not differ significantly from each other.

TABLE 1

STANFORD-BINET MEAN IQ DATA

Test	Time	Karnes (N=24)	Traditional (N=25)
1	Before Preschool	96.2	94.4
2	After Preschool	110.3	102.6
3	After Kindergarten	108.6	100.0
4	After First Grade	104.3	100.0
5	After Second Grade	104.3	99.7
6	After Third Grade	103.0	100.4

At Test 6, both groups were significantly higher than they had been at Test 1.

The results indicate that the Karnes' program initially was more effective in promoting cognitive development as reflected in S-B scores than the Traditional program. After three years, however, the differential program effects of the two programs were no longer statistically evident. Nevertheless, the cognitive functioning of the children at the end of a five-year period was significantly above their initial level.

A second measure of cognitive functioning was obtained on the California Achievement Test. Since the overriding goal of the Karnes' program is to promote more effective functioning of the children in school, these data are considered to be more closely related to the major goal of the program. California Achievement Tests were administered to the children in both groups at the end of the second, third, and fourth years (first, second, and third grade level) after their initial year of intervention at age 4. Since reading is the most important skill that a child must acquire during the first three grades, analysis of the reading achievement data are presented in Table 4. At the end of the first grade, the Karnes' group was nearly one-half year (.45) ahead of the Traditional group, a difference that was statistically significant at the .05 level. A difference of nearly a half year at this level is obviously an educationally, as well as statistically, significant difference. At the completion of the second grade, the difference between the two groups was .29 year, a statistically and educationally significant difference. At the completion of the third grade, the difference between the groups was .22 year, which was also statistically significant. Although the differences between the two groups remain significant, it seems clear that the magnitude of the differences decreased over the three-year period of time.

TABLE 2

STANFORD-BINET IQ
REPEATED MEASURES ANALYSIS OF VARIANCE

Source of Variation	Sum of squares	Degrees of freedom	Mean square	F
Between subjects				
Groups	1,756.60	1	1,756.60	2.64
Subjects within groups	31,297.44	47	665.90	
Within subjects				
Tests	3,329.77	5	665.96	13.60*
Tests x groups	400.61	5	88.12	1.80
Tests x subjects within groups	11,508.45	235	48.97	

*Significant at .05 level.

TABLE 3

STANFORD-BINET IQ
NEWMAN-KEULS PROCEDURE

Group and Test	T–1	K–1	T–5	T–3	T–4	T–6	T–2	K–6	K–4	K–5	K–3	K–2
						Means						
	94.4	96.2	99.7	100.0	100.0	100.4	102.6	103.0	104.3	104.3	108.6	110.0
						Differences						
T–1		1.8	5.3*	5.6*	5.6*	6.0*	8.2*	8.6*	9.9*	9.9*	14.2*	15.6*
K–1			3.5	3.8	3.8	4.2	6.4*	6.8*	8.1*	8.1*	12.4*	13.8*
T–5				.3	.3	.7	2.9	3.3	4.6	4.6	8.9*	10.3*
T–3					.0	.4	2.6	3.0	4.3	4.3	8.6*	10.0*
T–4						.4	2.6	3.0	4.3	4.3	8.6*	10.0*
T–6							2.2	2.6	3.9	3.9	8.2*	9.6*
T–2								.4	1.7	1.7	6.0*	8.4*
K–6									1.3	1.3	5.6*	7.0*
K–4										.0	4.3	5.7*
K–5											4.3	5.7*
K–3												1.4
Table Value		2.80	3.36	3.69	3.92	4.10	4.24	4.36	4.48	4.56	4.64	4.72
Corrected table value		3.95	4.74	5.20	5.53	4.78	5.98	6.15	6.32	6.43	6.54	6.66

MS within/harmonic mean = 1.41.

* Significant difference at .05 level.

TABLE 4

CALIFORNIA ACHIEVEMENT TEST
MEAN TOTAL READING GRADE PLACEMENT SCORES

Group	Test 4		Test 5		Test 6	
	AGP[1] mean	Reading grade level mean in years	AGP mean	Reading grade level mean in years	AGP mean	Reading grade level mean in years
Traditional (N=25)	1.74	1.67	2.72	2.41	3.73	3.55
Karnes (N=24)	1.74	2.12	2.72	2.70	3.71	3.77

[1] Actual grade placement in years.

Repeated Measures
Analysis of Variance

Source of variation	Sum of squares	Degrees of freedom	Mean square	F
Between subjects				
Groups	3.76	1	3.76	2.89
Subjects within groups	61.22	47	1.30	
Within subjects				
Tests	78.14	2	39.07	384.55*
Tests x groups	.32	2	.16	1.57
Tests x subjects within groups	9.55	94	.1016	

* Significant at .05 level.

Newman-Keuls Procedure

Groups and test	T–4	K–4	T–5	K–5	T–6	K–6
Means	1.67	2.12	2.41	2.70	3.55	3.77
Differences						
T–4		.45*	.74*	1.03*	1.88*	2.10*
K–4			.29*	.58*	1.43*	1.65*
T–5				.29*	1.14*	1.36*
K–5					.85*	1.07*
T–6						.22*
Table Value		2.82	3.38	3.72	3.95	4.13
Corrected Table Value		.18	.22	.24	.25	.26

MS within/harmonic mean = .064.

* Significant difference at .05 level.

SOCIAL AREA

Social development has been an area of concern in preschool education, since some educators feel that emphasis on cognitive development means neglect of social and emotional development. Because of the questions that have been raised, it seems important to demonstrate, if possible, that the social and emotional behavior of a child can develop along with, rather than separate from, his cognitive growth. In so doing, support for the entire rationale for the Karnes' program, which is concerned with social, emotional, and cognitive development, would obtain.

Since one of the goals of the Karnes' Preschool Program was to enhance the social development of children so that they might better function in the classroom, it was deemed appropriate to obtain the teacher's perception of the children's social behavior. As a result, a brief follow-up questionnaire was administered to each child's public school teacher at the time of the follow-up testing at the end of the children's kindergarten year. Neither the teachers nor the interviewers knew which of the preschool programs the child had attended.

Inspection of the scores on the items relating to social development reveals that the two groups did not differ significantly on six of the eight items (Table 5). On two of the items, one relating to the child's confidence in approaching new tasks (Question 4) and the other to the child's self-concept (Question 5), the teachers rated the children who had attended the Karnes' preschool significantly higher than the children who had attended the Traditional preschool. This finding is of special interest since the goals of the Traditional program express substantial concern for the social and emotional development of the child, yet the children who attended that program seem to have done somewhat less well than the children who attended the Karnes' program. Although the evidence presented here should not be considered conclusive, it does support Weikart's (1967) point that programs directed at language and intellectual development are not only effective in achieving that goal but also affective in promoting social and emotional development.

A second concern, expressed by some, lies in the area of possible negative effects on work habits that might be fostered by a highly structured program. These critics feel that since the teacher maintains a high degree of control in a structured program, the children will not internalize good work habits and will subsequently demonstrate poor work habits in the less structured public school setting with its higher pupil-teacher ratio. Since one goal of the Karnes' program is to develop the child's confidence and enjoyment of learning situation, the findings on the six items of the questionnaire relating to work habits are most interesting. Substantial and significant differences in favor of the children who attended the Karnes' program are found on all six of the "work habit" items in the questionnaire (Table 5). In these aspects of behavior, so critical to effective functioning in the public school classroom, the children from the Karnes' program are functioning at the "Usually" and "Always" levels, while the children from the Traditional program are functioning at the "Sometimes" level. From the foregoing data, it appears that the Karnes' program resulted in social gains that were equal to or greater than those made by children in a Traditional program, in spite of the fact that the goals of the Traditional program expressly state that the acquisition of social skills is of prime importance.

AFFECTIVE AREA

One of the basic questions raised about programs in early education is "What effect does the program have on the affective development of the child?" This question is raised most often when highly structured programs are being evaluated because the traditional belief about preschool is that children should be able to select, freely, the activities with which they will engage rather than being provided with teacher-selected activities designed to be interesting and appropriate yet stimulating in the cognitive and language areas.

From the brief abstract of the conceptualization presented earlier, it is clear that one of the goals of the Karnes' program is to enhance the affective, as well as the cognitive, development of the child. It is believed that structuring helps the child more readily discriminate that which needs to be learned from the less relevant aspects of the world about him so that he can learn more quickly and easily. Further, it is believed that children who learn in a setting where they receive positive reinforcement frequently, and who are helped to believe that they can learn something, will be positively oriented toward school and work and, thus, themselves. In view of the foregoing it was decided to gather data that might help reveal whether or not a structured program interfered with the affective growth of children and, if possible, to ascertain whether or not the Karnes' curriculum did, in fact, enhance affective development.

Information pertinent to the affective development of children was gathered on all but one of the subjects who had been previously enrolled in either the Traditional or Karnes' Preschool Curriculum (N=24 in each group). At the time these data were collected, the sub-

TABLE 5

QUESTIONNAIRE ADMINISTERED TO PUBLIC SCHOOL TEACHERS AT THE COMPLETION OF KINDERGARTEN YEAR (TEST 3)

Item	Group mean		t	Level of significance
	Karnes	Traditional		
Social Development				
1. Gets along well with other children (shows respect for others, has empathy with others)	3.75	3.88		
2. Is cooperative (shares equipment, takes turns)	3.92	4.00		
3. Takes failure in stride	3.46	3.52		
4. Manifests confidence in approaching new tasks	3.92	2.96	3.17	.005*
5. Has a positive self-concept	3.79	3.16	1.96	.05
6. Shows self-control	3.62	3.52	.35	NS
7. Relates well to the teacher, accepts her authority	4.00	4.20		
8. Shows freedom from nervous habits (thumbsucking, nailbiting)	3.83	4.12		
Work Habits and Attitudes				
1. Listens carefully and follows directions for play activities	4.08	3.68	1.77	.05
2. Listens carefully and follows directions for academic activities	4.04	3.20	3.51	.005
3. Volunteers in discussions	3.71	3.16	1.52	.10
4. Has good work habits (begins assigned work promptly and persevers)	4.42	3.24	4.35	.0005
5. Remembers learnings from day to day	4.08	3.04	4.82	.0005
6. Has attention span commensurate with C.A.	4.00	3.20	3.11	.005

* One-tailed test.

NOTE: The questionnaire was administered orally to the child's teacher who was asked to respond on a five-point scale: (5) Always, (4) Usually, (3) Sometimes, (2) Seldom, and (1) Never.

jects were at the mid-fourth-grade level. Information was gathered by graduate students who went to the school where the child was enrolled, took the child, and individually administered (1) a "crossing out T's" test and (2) a short form of a sentence completion test designed for oral administration to elementary-age children. After talking with the child briefly, the "crossing out T's" test was used to establish a working relationship. The "T's" test was administered under both low incentive, "I want to see how many you can do," and high incentive, "This time I will give you candy for every T that you can cross more than you did last time," conditions. Although the task was basically administered to establish a positive response set in the child, the results of the test were analyzed to determine if there were any significant differences between the two groups on the test. Briefly, the results revealed that the children from both programs worked significantly harder for reinforcement under the high incentive condition than the low incentive condition and that there were no significant differences between the groups in the way they responded to either the low or high incentive conditions. These findings suggest that the children became involved in the task preparatory to engaging in the new phase of the evaluation and that their involvement did not differ with their placement in either the Traditional or Ameliorative program.

Once the examiner thought the child was ready, he administered, orally, a 17-item Incomplete Sentence Test designed to tap the child's attitudes and belief about himself, his friends, other people, and school-related activities. The test was scored in two ways: (1) to assess pupil's general attitude toward himself, others, and school and (2) to assess his attitude toward school and school-related activities. All testing and scoring of materials were accomplished on a "blind" basis such that neither the scorer nor data gatherer knew in which preschool program the children had previously been enrolled. To assess general attitude, all items were scored using a revision of the approach described by Rotter (1950). Children viewed as being conflicted in an area were given *higher* scores than children who were viewed as having less conflicts in the area. The results (Table 6) show that the Karnes' subjects, who attained a mean score of 39.00, have expectedly fewer conflicts than the children in the Traditional program whose mean score was 40.71. A t test to determine the significance of the difference between the two means revealed a t of .86 (df = 46) which did not attain the .05 level of significance (t = 1.68). The findings reveal that, contrary to the beliefs of many critics of structured cognitively based programs, there was no difference between children formerly in the Karnes' Preschool Program and in the Traditional program. In fact, if any difference could have been established from the data, it would most likely have revealed that children in the Karnes' program are less conflicted and therefore, considered to be better adjusted than the Traditional children.

TABLE 6

ANALYSIS OF SENTENCE COMPLETION DATA

	Karnes		Traditional		
	X	S2	X	S2	
Full scale	39.0	41.04	40.71	57.06	.86
School scale	7.42	8.95	8.71	10.04	1.45
Achievement-related scale	2.46	.76	2.79	.34	1.53

N = 24 in each group.

The second question asked of the incomplete sentence data was, "Are the children from the Karnes' program less conflicted in the school area than are the children from the Traditional program?" A separate analysis was made of the items whose stems were school oriented (School–, Arithmetic–, Reading–, in School I like–). Each child's scores on these four items were summed to provide a subscale score associated with the child's attitude toward school. On the "School" subscale as reported in Table 6, children in the Karnes' program attained a mean raw score of 7.42 while children in the Traditional program attained a mean raw score of 8.71. Comparison of the means by t test revealed t = 1.45 which did not attain the .05 level of significance (t = 1.68) but would have attained significance at the .10 per level (t = 1.31).

Evaluation of these findings reveals that contrary to popular belief, the children in the highly structured, cognitively based Karnes' preschool curriculum were no more conflicted in their attitudes toward school than children in a traditional program. Further, if any trend might be evidenced it is that the children in the Karnes' program had fewer conflicts in their attitudes toward school and, therefore, would be assumed to be better adjusted. For example, children in the Karnes' program are likely to give responses such as "School *is fun; is good for learning; does many things for you*" rather than "School *makes me sick; gives me a headache*" or "Reading *is my favorite subject; is fun*" rather than *is 0* or *is horrible.*

One interesting question raised by a post hoc review of the completions is "What effect does a structured program have on a child's perception of his peers?" To the stem "My classmates–," children might answer "Are my friends; play; are fun." They might, on the other hand, answer "Are smart; beat me in my work; are very good at math." A post hoc study of responses to this stem suggested that they might be scored along two dimensions: (1) with regard to social acceptance and (2) with regard to the extent to which the responses suggested that the child might be aware of the behavior of peers, especially achieving behavior. Comparison of the Karnes' group with the Traditional on the social acceptance subscale revealed almost identical mean. This suggests no probable difference in the amount of positive social acceptance felt by the subjects. On the other hand, a t test of the difference between the mean raw scores on the achievement related subscale of 2.46 for the Karnes' group and of 2.79 for the Traditional group yields a t of 1.53. This result, although not statistically significant, suggests the need for further study of the awareness of the work orientedness and goal directedness of peers. If such a study could be made with appropriate instruments, it may sensitize educators to the possibilities of changing values through small group structured activities, especially during the preschool years. Moreover, future findings might reveal that children from a Karnes' program mature at a slightly more accelerated rate, so that they reach the "sensitivity to peers stage" more quickly than children from other programs. Such a finding would be consistent with the belief that the Karnes' Preschool Program enhances the emotional development of young children.

SUMMARY OF FINDINGS

Data pertinent to the longitudinal effects of the Karnes' Preschool Program on four-year-old children relative to cognitive, social, and affective variables reveal differential effects associated with programming. In the cognitive area, the Karnes' Preschool Program was shown to have a strong initial positive effect on the intellectual functioning of children which even after five years was significantly above initial level. Further, the Karnes' program produced initially higher gains than the Traditional program in intellectual functioning, although the difference between the two tended to disappear after two years of attendance in the public schools. With regard to academic achievement, children who had been in the Karnes' program, after four years were achieving at a significantly higher level, almost a quarter of a school year, than children from the Traditional program.

In spite of dire predictions of negative effects of a structured program on the social and affective growth of children, these beliefs were not only refuted but the data suggest that the structured program significantly enhance children's functioning, at least in the social area. Thus, the data support the contention that the Karnes' Preschool Program significantly enhances the functioning of children in the cognitive, social, and probably the effective areas. Serious consideration must, therefore, be given to the further study and implementation of structured programs.

IMPLICATIONS FOR IMPLEMENTATION

A preschool program based on a specified set of theoretical assumptions has been created and developed to the point where goals, objectives, procedures, and criteria have been delineated and prepared for publication. The program is classified as being a highly structured, cognitively based program with high emphasis on language development. Further, it incorporates within its structure specific goals related to the emotional and social development of the child. Longitudinal evaluative data provide extensive support for its worth in that children who received the program at age 4 still manifest significant gains after four years in a variety of public schools located in two States and seven community school systems. Hawkridge (1969), in an analysis of successful and unsuccessful preschool programs, has identified three critical dimensions: (1) careful planning including a statement of objectives, (2) teacher training in the methods of the program, (3) instruction and materials closely related to the objectives. Since these three factors are also basic to the Karnes' program, it provides additional impetus for its implementation. Weikart (1967) has stated that language development is an essential element of successful programs. Again, the Karnes' program is consistent with this thinking. In view of the foregoing, serious considerations must be given to expanding and improving the program and implementing it in a variety of settings.

To implement the program it is essential that the implementor be fully cognizant of the critical program dimensions. Katz (1970) has described a set of parameters for organizing and analyzing information concerning early childhood education.

CHARACTERISTICS OF CLIENTS

Since the Karnes' preschool curriculum is a structured program which requires a careful analysis of the needs of the children, careful consideration of the characteristics of the clients is a necessity. In addition to the typical age, sex, and physical health variables, problems associated with variables such as urban/rural setting, language spoken in the home, goal orientation of parents, family structure (nuclear vs. extended), number of siblings, and economic conditions of the home and community will all have a substantial bearing on the selection and sequencing of the activities presented.

CHARACTERISTICS OF TEACHERS AND OTHER ASSISTING ADULTS

The selection and training of teachers and teacher aides to implement the program is crucial. It is believed that the teaching strategies utilized in the program are most effectively implemented by individuals who are able to understand and adapt to an organized way of life. This does not necessarily mean that they come to the program from organized backgrounds, but, rather, that they are open and flexible enough to understand and adapt to the ideas inherent in the program so as to use the approach effectively.

Although the data presented in this paper were gathered from a study which used trained teachers in both settings, replication of the Karnes' program, which used paraprofessional personnel in the classroom as teachers, was conducted (Karnes, Hodgins, Teska, 1969). The findings demonstrate that paraprofessionals can successfully implement the program if provided with close supervision and in-service training. These findings suggest that there will be a strong need to train both master teachers, who can conduct quality in-service training programs, and paraprofessionals to staff future programs. Teachers have to be effective predictors of what is needed and what will come, rather than be reactors to the activities of a child. In this way, they need to be more of a guide—a leader rather than a reactor. Potential teachers, whose goals are inconsistent with the above, may find implementing the program to be difficult. Again, paraprofessionals have effectively learned the program, apparently because of the direction and security inherent in the structured approach. At the present time, age, sex (except that males can make strong contributions to the development of boys), and occupational status seem to have relatively little effect on their success in the program.

PROGRAM ORGANIZATION

This parameter, as stated by Katz (1970, p. 4), is what is commonly referred to as curriculum. In the Karnes' Preschool Program, careful consideration has been given to the planning of the day, the amount of teaching time per area, the amount and type of structure. Implementation of this aspect of the program, then, should initially be simple. Further, adaptation of the program to meet local needs should also be easy because careful structuring permits the anticipation of conflicts before they occur so that alternative plans can be developed.

Since it is important that the teacher be involved in the program planning for the children, the curriculum consists of model lesson plans (1,500). The teachers, then, must modify some lesson plans or develop new ones relevant to the needs of his particular children. Thus, the curriculum deliberately is not a "canned program" to be followed "Slavishly" from beginning to end.

PHILOSOPHICAL ORIENTATION AND HISTORICAL FACTS

The philosophical basis for the Karnes' Preschool Program has been elucidated previously. Basically, it is a program that is selectively eclectic in its sources of origin. Principles, processes, models, procedures that have been found to work have been adapted and revised to provide a cohesive whole. Understanding these basic principles will facilitate the implementation of the Karnes' Preschool Program.

PARENT PROGRAM

The basic philosophy behind the Karnes' Preschool Program is that parents can and must be an integral part of the program. Careful planning, concern for the parents and their desires, and staff flexibility are all prerequisite to developing the most effective relationships. In some instances, the hiring of paraprofessional home visitors to work with parents may be very beneficial.

ADMINISTRATIVE FACTORS AND SPONSORSHIP

The source of funding is not crucial to the successful implementation of the program. Appropriateness of leadership, division of labor, understanding of the roles of each staff member, low teacher-pupil ratio, efficient delegation of authority are crucial to the success of the program.

The structured approach has many benefits for the administrator since it eases the job of in-service and pre-service training, allows the employment of paraprofessionals, provides a structure wherein both administrator and teachers know what is expected of each teacher. Supervision and support, then, are readily obtainable. Similarly, when an aspect of the program proves ineffective, the teacher can work with the administrator in a positive way, to develop improved lesson plans.

LENGTH OF PROGRAM

The length of the day for the Karnes' Preschool Program is flexible. For example, in a two-hour class the essential components of the curriculum can be provided. Not all components will be implemented daily in such a short period of time, but they can be programmed during a week. With a longer period of time, all components of the curriculum can be presented daily. Thus, the Karnes' Preschool Program can, with careful planning, be readily implemented in day care centers where children are present for varying periods of time. Choice of length of program must be determined at the local level in conjunction with such factors as cost, transportation time, availability of personnel, parental goals.

PHYSICAL PLANT AND CLIMATE

Characteristics of the physical plant for the Karnes' Preschool Program will vary with the amount of time the children are in school and the local goals. Typically, the physical plant should include a large room, approximately 20' x 30', and several smaller rooms, 9' x 12', that can be used for structured small group activities. The program can operate effectively in a large room which can be quickly and easily subdivided by movable dividers. Tables and chairs of a suitable height are needed to help structure the small group situation. Typical preschool materials such as puzzles, books, pictures, phonograph, piano, paper, crayons are also necessary but can vary with the local situation.

The local climate should have limited effect on the implementation of the basic components of the program. Most activities are designed to be implemented in small groups indoors. Of course, the opportunity to play in fresh air for a part of the time is always encouraged but it is not crucial to the implementation of the basic program. Field trips may be more convenient in moderate climates, but local adaptation to the weather may, with reasonable caution, permit frequent outside activities.

In spite of the significant differences obtaining at the end of the third grade, it is clear that the positive effects of the preschool program are being abrogated by insensitive public schools. This suggests the necessity for upgrading the program of public schools, by effectively involving parents in classroom activities. Additional personnel, probably paraprofessionals with special training, will need to be employed. In addition to their work with parents, paraprofessionals will also need to become involved with the community at large, bringing to the school reflections of the community's goals and attitudes and carrying to the community interpretations of the school's needs and offerings.

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CHAPTER 7.
LEARNING TO LEARN PROGRAM

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INTRODUCTION

The impetus for designing the Learning To Learn Program came from the author's study of a growing research literature which questioned some traditional assumptions concerning child development.

One assumption questioned was that the child is not ready to reason or deal with organized learning material until the primary grades.

A second assumption was that the major function of early education is to promote the social and emotional development of the child and to place comparatively little emphasis on cognitive development.

A third assumption was that the young child must initially acquire factual knowledge or content in order to develop adequate learning skills for later school success.

A fourth assumption was that the child enters kindergarten with a broad range of emotional, social, and cognitive experiences.

Reading the research literature and working extensively with young children led the author to two conclusions:

1. the narrow definition of the whole child had grossly underestimated the child's psychological strength and potential for learning and
2. most of the typical kindergarten experiences were neither relevant nor appropriate to what lay ahead for children, especially poverty children.

The limitations of the traditional kindergarten program suggested the need for a new direction in early childhood education. It seemed worthwhile to design and operate an early education program which: (1) gives the teacher and child a sense of purpose and direction, (2) makes the teacher responsible for the emotional-social-cognitive development of every child, (3) recognizes individual differences and adjusts teaching strategy to each child's rate and level of learning, (4) provides a continuum of learning experiences to match the child's rate and level of learning, (5) makes the child aware of the learning process and how to utilize himself to learn, and (6) provides continuity with first grade.

The above characteristics formed the basis of a structured program with specified behavioral objectives. The Learning To Learn Program was a comprehensive approach to the education of children, integrating the variables that bear directly on education: the child, the teacher, the curricular materials, and the parent.

The program was based on three premises regarding children and their education. First: the educational process begins in early childhood. An organized, systematic, sequential curriculum and curricular materials should be introduced at this point. Second: the first few years of school should provide the child with opportunities to learn to learn. These opportunities are of an emotional-social-cognitive nature. Third: every child has an inner drive toward maturity, increased competence, and mastery over his environment, and looks to adults for behavior and attitudes which are appropriate to this growth.

The following principles guided the design and development of the Learning To Learn Program:

1. The likelihood for meaningful and permanent learning is greater if the child is given the opportunity to be an active learner and from the onset is given a major share of work and responsibility. This lively participation can be achieved through an open discussion and exchange of ideas between teacher and children; also through involving the child in decision-making and problem-solving activities. The teacher must allow the child to be more active than she.
2. Inner satisfaction and feelings of adequacy develop when the curriculum is structured so that the child can cope with and master each new learning experience. The confidence gained from each success improves his performance and stimulates his growth toward independence and responsibility.
3. A child's awareness that the application of his knowledge has made a contribution to himself and to someone else builds up a sense of self-worth.
4. Learning appears to be more meaningful to the child when it comes in the form of a problem or game which challenges him and sparks his curiosity. The challenge occurs when he meets a situation that is familiar yet includes an element of the unknown or calls for a level of functioning one step higher than what he is used to.
5. Knowledge, language, concepts and attitudes acquired in school will more likely become a part of the child's permanent repertoire of behavior if they are immediately useful to him in the making of decisions and the solving of problems in his daily life.
6. The child should be given opportunities for the interaction of multiple sensory and motor activities, and he should be encouraged to develop language to talk about these activities.
7. Exposing the child to learning experiences will have lasting good effects only when these experiences are properly timed and structured and offered to the child on a continuing basis.
8. The child learns to communicate effectively from interaction with a teacher who stimulates and sensitively guides his reasoning. She provides a friendly social setting for an exchange of views and a sharing of information.
9. For lasting effects the school should provide for the active involvement of parents and encourage their commitment to the objectives of the program.

These principles led to the specific objectives of the Learning To Learn Program which are outlined below:

1. to introduce a continuous sequential curriculum founded upon concepts and structures seen as basic to the overall development of young children.
2. to change the traditional role and function of the teacher by emphasizing:
    a. responsibility for seeing that every child, every day, is exposed to planned learning experiences and materials.
    b. guidance and stimulation which diminish teacher participation and increase conversation and social interaction.
    c. active participation, inquiry, and exploration by the child.
3. to change the traditional role and function of the child by emphasizing:
    a. development of those inner attributes which enhance learning: attention, concentration, delay before responding, reflection, persistence, effort, etc.
    b. performance over achievement.
    c. application of knowledge acquired in order to make a contribution to himself and to someone else.
    d. awareness of how he is learning and can utilize himself in learning.
    e. independence through freedom with responsibility.
    f. skill in developing strategies for problem-solving and decision-making.
    g. balanced social, emotional, and intellectual development.
4. to accommodate individual differences in the rate and level of learning by a carefully sequenced curriculum, a variety of curricular materials, and the use of small groups monitored by a teacher who adjusts her teaching methods to these differences.
5. to give the teacher an opportunity to work with small groups and individual children by utilizing teacher assistants.

6. to involve parents and encourage their commitment to the objectives of the program by an active parent education program and by the provision of "homework"-type activities which reinforce the activities and values of the school.

The author anticipated problems implementing these objectives. The teacher's conventional training and experience did not fully prepare her for her role and functions. The new philosophy, methods, techniques, teaching styles and the new definition of the child's role differed substantially from what she had previously encountered. The unique home experiences of the poverty child, his methods of communicating and of relating to teachers and peers were unfamiliar and not consistent with her own background and training.

The author anticipated the poverty child's difficulty in making the transition between the methods of control, communication, and problem-solving used in his home to the methods used at school. He expected that the child's past experiences would interfere with the development of the learner role and with his ability to take full advantage of classroom opportunities.

In view of their own school experiences, most of which were disappointing and unrewarding, there was some question as to the parents' willingness to participate and cooperate. This "parent education" aspect of the Learning To Learn Program was the weakest, most vulnerable, and the most likely to fail. The research literature spoke of poverty parents' child-rearing practices, health and nutrition practices, methods of discipline and control, attitudes toward school and education which might place severe limits on what the school could hope to achieve. A negative home environment could erode the positive effects on children of the school program. At the same time the literature offered very little guidance to those working with parents of poverty children. The author had no experience with such parents but gained it gradually as he pursued his goals of persuading poverty parents to come to monthly meetings, gaining their confidence and respect, getting them to participate actively in the parent education program, and enlisting their cooperation to follow through on the learning activities the school provided for home use.

Sample

All the children in the program were from low-income black families. It was their first school experience and, for most, their first group social experience.

In addition to language and communication deficits, these children manifested social and interpersonal problems, problems of motivation and of poor attitudes toward education, authority, and adults. Some were unable to take advantage of the opportunities of the classroom.

The parents', and in some instances grandparents', description of their children at the first parent meeting prior to the opening of school gave the teachers some insight into the temperaments of the new pupils. The parents were asked how they would like the school to help their children during the school year. Some of their responses follow:

> "Teach him to be not so mean."
> "Teach him not to fight his brothers and sisters."
> "Teach him to mind me."
> "Teach him not to talk so much and so loud."
> "Teach him not to just take things from somebody."
> "Teach him his ABC's."

The parents of these children were on welfare or were employed in unskilled jobs. In approximately 40% of the homes, the fathers were absent and in a few cases, the child was living with grandparents. The number of children per family ranged from 3 to 9.

The children in this study came from adult-centered homes. Even when the parent was home there was very little adult-child interaction. In many cases the adult watched television late into the night in the same room where children had to sleep. Frequently, the oldest child had the responsibility of supervising the younger children during the day. But in the evening and on weekends, when the parent was home, there was still very little adult supervision.

Program Description

The classroom was organized and managed so as to perform two functions. The first function was to achieve "here and now" goals. That is, the exposure to a variety of enjoyable experiences and the satisfaction of immediate needs for movement, stimulation, pleasure, exploration, manipulation, and social-emotional interaction. The second function—for the attainment of future goals—was to follow-through on the experiences of the small group.

The child's time and activities in the large classroom were, for the most part, unstructured. For example, following a "morning circle" which was made up of activities with emotional and social overtones and which followed up on "homework" activities brought to school, there was a free activity period for one-and-one-half to two hours.

Play was the central activity during this time. The classroom was equipped with a wide variety of materials. The children were free to choose what they would do. (They could stay with the material as long as they wished and were free to choose their playmates.) An aide was in charge of the classroom.

The uniqueness of the Learning To Learn Program was the use of a second learning environment where four children, and the teacher, played with sequential curricular materials. This was a hallway, supply, or clothes room that was free from visual and auditory distractions and protected from intrusions by classmates. Early in the year, each group spent 15 minutes per day there; in the spring, the periods lengthened to 20 to 30 minutes. Its primary function was to point up to the child how human interaction and personal involvement are closely linked to learning and must work in harmony for personal and group advantage. This learning environment was arranged and managed:

1. to promote learning as a personal experience that requires work, effort, persistence, and reflection. Ideas were sought, not right answers. Completion and cooperation were emphasized, not winning and competion.
2. to promote learning as a means to an end by providing opportunities—through games and gamelike activities—to use what is learned.
3. to establish a "mental set" for learning. This was a special place and a special activity which required a specific set of behaviors and attitudes.
4. to promote learning as a social experience to be shared and enriched through interaction. The listening, sharing, and delay required gave every child first-hand knowledge of personal and property rights.

The primary purpose of the curriculum of the Learning To Learn Program was not to fill the child with facts and information. Rather, the curricular materials, the content of which was common to all children, were organized and structured:

1. to develop meaning through first-hand, practical experiences.
2. to give children the opportunity to learn through many modalities.
3. to show children how old and new knowledge fit together and build onto each other in an orderly and organized fashion: a learning hierarchy.
4. to give children and teacher a sense of direction and purpose.
5. to provide a continuum of learning experiences to match the child's rate and level of development.

Both the curriculum and curricular materials underwent continuous reassessment and revision as the test data and teachers' evaluation indicated areas of weakness and problems with language and materials. The revision and expansion of the published material, now in process, reflect this sensitivity to the test results and to judgments of the teachers who have used the material over the years.

One of the major changes was the shift away from heavy emphasis on cognitive development to a strong stress on the learning process and how it is influenced by human interaction, motivation, attitudes, and self-concept.

Our research and experience suggested that language and cognitive activities—to benefit later learning and development—must be nurtured within a human context solidly based on mutual trust, respect, and confidence. Furthermore, this kind of human involvement must be personal and on a daily basis.

The architect and master craftsman of such a balanced and healthy developmental program was the teacher. Her personal style and her wise and imaginative use of the learning environment and curriculum captured the eyes, the ears, the brain, and the heart of every child. She was a good saleswoman who believed in what she was doing. She gave of herself without asking for immediate results for her efforts. She had faith that each child could learn and was patient but persistent in her efforts to make it happen. Her unhurried but steady pace, her calmness and friendly smile, and the physical closeness of the small group made each child feel wanted and comfortable. It was primarily these small-group times which brought about the changes in self-concept, group and social responsibility, respect for self and others, motivation for and interest in learning. And it was the teacher who made it all happen. Specifically, her role was to:

1. provide an open-ended type of conversation and inquiry to arouse the child's curiosity, challenge his level of ability and invite him to talk about his present and past experiences with the material.
2. ensure every child's right to be included and participate if he chose. And whatever the child's

contribution, the teacher made him feel good about it, even when she had to correct misinformation.

3. create a learning climate whereby the child felt free and safe to talk about his own ideas and thoughts without fear of being wrong or different from the group. The child continuously heard and saw that he could be different and still be accepted. Ideas, rather than right answers, were rewarded.
4. recognize individual differences and adjust her teaching strategy to each child's rate and level of learning.
5. encourage active participation and stimulate the child's attention, thoughts, experiences, and knowledge so that he could gain insight into how he was learning and how to utilize himself in learning.

In summary, the healthy behavior and attitudes the child displayed in the large classroom (discipline problems were rare) took root in the small group learning environment. The three components which made a difference were:

1. a teacher who combined a role and style which touched the life of every child, every day, in a very personal way, and who permitted the child to touch her life.
2. an arrangement and management of the learning environment which promoted awareness of self and others and the learning process.
3. an organization and use of a structured curriculum that provided security, inner organization, and direction without being repressive and restrictive for teacher and child.

The focus of the curriculum was on the learner and the learning process, with the content serving only as a vehicle. The content was, nevertheless, carefully selected according to its relevancy to the child's experience, its familiarity to children of all socio-economic backgrounds, and its availability.

There was a language component[1] and a number and space component.[2] The language component was constructed around five content areas—clothing, food, animals, furniture, and transportation. The number and space component used sticks which vary in size and color, animal dice, and animal cards. The tools of learning changed through the year from the use of concrete, manipulative objects to a higher level of pictorial representations and, finally, to an arrangement of stimuli and experiences in a logical spatial and temporal order. This last level was designed to encourage self-expression and effective communication of thought processes.

The organizations of the materials enhanced the learning process and allowed for reinforcement and reward. The same format of organization was maintained through each of the five content areas. The content changed but the format for the sequence of games remained quite similar. For example, the unit on transportation began the same way as the unit on animals, with miniature objects of that category which the child manipulated, explored, and talked about. Both units were revisited, but at a higher level of complexity, using the same game format and organization. Through this consistency of organization the child became comfortable using the materials and developed a set of learning attitudes and behaviors which were continuously reinforced. He began to know what to do and how to do it even though there was a change of content. He began to know that each successive game—whatever the unit—utilized the knowledge, strategies, attitudes, and learning sets of the preceding games but took them one step further.

Parent Education

Parent education was a prominent feature of the program. The monthly meeting was held in the classroom at a time convenient to the parents (Sunday afternoon at 3 o'clock). The teachers, teacher assistants, and director were present at every meeting to help the parents. The program itself was non-directive and parent-child-classroom oriented.

Unlike traditional PTA meetings, there were no lectures, no fund-raising activities, and no material rewards for attendance. Rather, the staff appealed to the parents' sense of pride and responsibility. The focus of the program was on their individual children and on an understanding of what the staff was trying to accomplish through the various means: the curriculum, organization and management of the classroom, and the role and function of the teacher.

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[1] Inquisitive Games, Discovering How to Learn. Science Research Associates (SRA), 259 E. Erie St., Chicago, Illinois 60611.

[2] Inquisitive Games, Exploring Number and Space. Science Research Associates, 259 E. Erie St., Chicago, Illinois 60611.

There were three parts to the meeting: general announcements, video-tapes followed by parent discussions, and the demonstration of curriculum and how it related to suggested home activities.

After viewing video-tapes of the large classroom and the small groups, the parents found it easier to talk in reference to their own child. They could better understand how to conduct the activities which the staff suggested be done at home. They saw the staff as models demonstrating how children could learn with their parents' help. Parents could identify with the teacher role. They developed a feeling of respect for the teacher and trust in her ability to provide cognitive, emotional, and social growth. The most frequent comments by the parents were: "The teacher cares about my child" and "She seems to have so much patience."

The parent education program, therefore, tried: (1) to create and maintain a learning environment at home, (2) to instill the school's values in the home, where most learning occurs, (3) to move the parents to an active commitment to education, (4) to establish a closer parent-child relationship, and (5) to establish communication between school and home through a parent-teacher relationship that fostered mutual respect and confidence.

The high attendance at these meetings was not accompished easily but was due to sheer persistence, patience, personal dedication and sacrifice on the part of the teachers and teacher assistants. The staff was unanimous in their observation that the amount of contact between mother and child had to be increased and the quality of that contact improved if the gains made in the Learning To Learn School were to have any holding power on the child when he entered the public school. The staff was determined and committed to do what was necessary to earn the respect and confidence of the parents; the result was the substantial improvement in getting parents committed to education and to the objectives of the program.

First Grade Program Description

We had children in mind when we designed the first grade program. Our interest was a classroom in which children were attracted and drawn to learning, attracted and drawn to each other, and attracted and drawn to the teacher. We assumed that if the surroundings, the material, and the people were familiar enough, first grade could continue where the 5-year-old program ended. So the same children, the teacher, and aide came along to first grade. The room was not the same, but the teacher and aide organized it in a fashion similar to the classroom of the previous year. The curriculum content and the teaching practices which worked so well the previous year and were so familiar to the children, were continued.

By putting a wood frame on wall board (bulletin board) and attaching two legs, the large classroom was partitioned off to make separate learning centers. Tables and chairs—arranged in fours so children could easily discuss and talk with each other—took up about half of the classroom. Across the room two learning centers were separated with the bulletin board on legs. One center was for typing and the other for listening. To reduce distractions and to encourage individual work, six little cubicles—made of heavy cardboard and glued to the table—provided each child with his own workspace and earphone. One corner of the room was partitioned off for the reading center. It had a rug where the children sat or stretched out. There was also a library table. Books could be used anywhere in the room—in an isolated spot by one child or shared with someone else. The classroom had a special rug which separated the tables and chairs from the typing and listening centers. As a child finished his work he came to the rug where he and the teacher sat together to read or talk about it. Other children frequently sat in (or stretched out) on the close and personal get-together waiting their turn or just listening to the teacher and child.

The children were free to move about at will, to talk and work with each other. The social, language, and intellectual development fostered through this kind of working together were perhaps the most obvious, but certainly not the only, benefits derived from this classroom organization and management. By giving children the freedom, independence, and responsibility to do as much for themselves and each other as they could, the teacher was free to help every child on an individual basis. Rarely did the class get together as a group. Most of the time it was teacher (or aide) and child working together at a time selected by the child.

The content of the curriculum, which combined numbers, language, social studies, science, and art, was a continuation of the five-year-old program. The day began with math. The children were divided into three groups: the aide worked with one group on the rug in the reading corner; the teacher had a second group on another rug; and a third group had a math activity on the listening tape. When finished, this last group had a choice of activities until the teacher and aide finished their math lessons. The teacher then took this third group for math while the aide played math-related games with the first two groups.

The teacher maintained personal and close contact with the children by arranging them in a circle around her. Each child was separated by a heavy cardboard glued to a piece of 2 x 4 to keep it standing. For a workspace each child had an 18 x 24 cardboard.

A game and activity centered approach with Cuisenaire Rods were used to teach math. Card and dice games, and board games that require the child to guess, judge relationships, and solve problems, give children a personal and first-hand experience with numbers and operations.

Following a short break for a song or a moving-around activity the whole group came together on the rug. Here the teacher aroused the interest and curiosity of the group with a real-life experience which was familiar to everyone. The more the children participated in developing the activity, the more involved and thoughtful they became. When it appeared as though everyone understood the activity, and had his own ideas about how to proceed, the teacher turned everyone loose to follow his own individual lead. Everyone was on his own to extend the activity in his own direction and take as long as he wished to finish it. While they were free to work together, the individuality and diversity of the final products indicated the children treasured their own ideas more than the ideas of another child.

This activity was interesting because it allowed them to be active and involved with something they know about from their own experience. It was challenging because they had to retrieve from memory past knowledge, then organize and think about it in a new way to fit the activity. They met the challenge successfully because of their opportunities the previous years to think, reason, generate ideas, and solve problems.

The teacher's choice to begin the school term with this activity was not left to chance. She knew the children and continued the curriculum from the point at which she stopped the previous year. As five-year-olds, they frequently used art to express ideas and to give new words concrete meaning. So it was logical and sensible to begin first grade with activities that involved drawing pictures and writing words. This led to pictures and sentences and then pictures and creative stories. While art remained a favorite means of expression for many children, others preferred just to write. They became so proficient at writing that they could take two unrelated words like *hen* and *church* and develop a creative story. By the end of the year two other favorite activities were interpreting works of art (the teacher borrowed prints from the local public library) and writing their own endings to stories. The teacher would pick a story in which people or animals would be confronted with a predicament, conflict, or decision. She would read up to that point and stop; from there the child would take over.

Children were free to pace themselves with this activity. Some began and remained with it until completion. Others paused to engage in another activity they selected and then returned to the original task. As a child finished he came to the rug where he would talk about his picture and read the words, sentences or story he wrote. The teacher did not correct the finished product in the usual sense of being right or wrong. She did, however, have a standard for each individual child. She knew the past performance of every child in the class and she expected the child to come up to his own past performance. She accepted his work but let the child know if that task was or was not typical of his past performance. She might say, "I can tell you worked hard to do this, Claude, and you did such a good job," or "I can tell you worked very fast and did not think with your brain because this does not look like Eric's work."

After he read and discussed this first activity with the teacher, she gave him his work folder, containing work to be finished by the end of the day. In the folder was at least one typing paper, one listening paper, and one reading paper. The folders were made up daily by the teacher and aide for each child. The number of papers and difficulty level was dependent upon the child's rate and level of learning. Consequently, not all children had the same work or same amount of work. Again, he could pace himself, but he had the responsibility to have it completed.

There was still another daily activity. Three or four children would go to the reading corner with the aide (or teacher). Here they would play dice games, card games, or board games with words and pictures. After they could recognize and use the words without the aid of the pictures, they read the words on sentence strips made by the teacher. When the teacher felt the group understood the meaning of the words and could use them, she let them read from the linguistic reader.

All materials and activities prepared for that day had a purpose and a direction. Everything was coordinated so that the learning activity on the listening tape was related to the typing activity and reading and language activities. The primary focus was on the understanding and use of concepts and symbols through first-hand experiences. The children understood the meaning of, and could use in a personal way, the words he met in a book. Reading was not an isolated subject but was tied to art, social studies, science, and human relationships.

DESIGN AND METHODOLOGY OF THE EVALUATION

Design

During the 1968-69 school year two groups of children entered the experimental program while two control groups were enrolled in traditional programs. (See Figure 1.)

Subjects were drawn from the same disadvantaged neighborhood in Jacksonville (Duval County), Florida. Two five-year-old groups were selected, with the experimental group (E5) attending the Learning To Learn School and the control group (C5) attending public school kindergarten in Duval County. Two four-year-old groups were also selected, with the experimental group (E4) attending the Learning To Learn School and the control group (C4) attending OEO sponsored day care centers in Jacksonville.

During the 1969-70 school year, group E5 was in first grade at the Learning To Learn School, group C5 was in first grade in the Duval County public schools, group E4 was in kindergarten at the Learning To Learn School and group C4 was in kindergarten in Duval County public schools.

During the 1970-71 school year, groups E5 and C5 attended second grade in Duval County public schools, group E4 was in first grade at the Learning To Learn School, and group C4 was in first grade in the Duval County public schools.

General Methodology

The following developmental characteristics were assessed for both the experimental and control children in our project:

1. general intelligence
2. ability to express ideas
3. language comprehension
4. verbal reasoning ability
5. concept formation
6. creativity and imagination
7. achievement motivation
8. school achievement
9. parental involvement in, and attitudes toward the education of their child (groups E5 and C5 only)

Children were assessed individually to determine measurements of the cognitive areas. Questionnaires were developed and sent to parents to assess parent and child attitudes regarding education.

FIGURE 1

DESIGN OF PROJECT

Year	Grade	Age	Group	Status	Grade	Age	Group	Status
1970-71	1st	6	E4*	C4	2nd	7	E5	C5
1969-70	K	5	E4*	C4	1st	6	E5	C5
1968-69	N	4	E4*	C4	K	5	E5*	C5

Disadvantaged Children

E4 N = 23
C4 N = 21

E5 N = 21
C5 N = 21

* In Learning To Learn Program

Experimental groups participated in Learning To Learn Program during nursery, kindergarten and 1st grade.

Control groups had either a combination of traditional day care, nursery, kindergarten, or elementary school experience.

The measures regarding group achievement were administered to groups of four children at a time.

The diagnostic measures were selected to assess general as well as specific developmental characteristics and the status of the children in the program. Specific attention was paid to selecting age-appropriate measures. The following criteria were used in the choice of diagnostic measures: ease of administration, validity, reliability, the availability of normative data, and predictability for measuring outcomes of school instruction. In certain instances we developed special measures to assess specific types of achievement behavior.

The examiners were experienced white male and female psychometricians with extensive experience in evaluating young children. They were clinical psychologists, doctoral students, or psychological assistants in psychology, who established rapport with each child before the testing began.

The cognitive–related measures were administered individually to each child at the school with which he was familiar. The testing consisted of several 20-30 minute sessions. If a child was ill he was rescheduled. Each examiner tested both experimental and control children.

Results

Intellectual Data

The E4 group's mean IQ gain over three years of the Learning to Learn Program was 19.3 IQ points while their control group (C4) gained only 3.0 over the same period. This represents a difference of 16.3 IQ points.

An examination of mean scores of Table 2 shows that the E5 group's Binet IQ score at the end of second grade in the public schools (and one year after the termination of their Learning To Learn Program) was 104.7.

The E5 group's IQ gain after second grade was 15 IQ points, while their control group (C5) lost 2.4 IQ points over the same period of time. The result: a 17.5 IQ point difference between the E5 and C5 groups at the end of second grade.

Achievement Data

When comparing the experimental (E4 and E5) and control (C4 and C5) groups on the subtests of the Stanford Achievement Test 1 (Table 3), the experimental groups out-performed their controls on all subtests. The E4 group superiority in terms of grade equivalents ranged from .6 years on word reading and paragraph meaning to 1.1 years on spelling, with a percentile rank difference of 48, 54, and 68, respecitively. The E5 group superiority in terms of grade equivalents ranged from .2 years on word reading to 1.1 years on the spelling subtest, with a corresponding percentile rank difference of 12 and 70.

Table 4 represents the post second grade comparison between the experimental (E5) and control (C5) groups on the Stanford Achievement Test II. This is one year after the Learning To Learn Program terminated for the experimental group. The E5's scored better than their controls on all subtests of the Stanford Achievement Test. Their grade equivalent superiority ranged from .3 years on language, which is a 14 point higher percentile

TABLE 1

A LONGITUDINAL 3 YEAR COMPARISON BETWEEN THE EXPERIMENTAL (E4) AND CONTROL (C4) GROUPS ON THE STANFORD-BINET INTELLIGENCE TEST

Measure	Group	N	Pre-Intervention 1968 X IQ Pre-Nursery	During Intervention 1969 X IQ Post-Nur.	1970 X IQ Post-K.	1971 X IQ Post-1st.	Mean IQ Gain or Decline Over Time	After 3 Yrs. X IQ Differences Between Groups
Stanford-Binet	Experimental (E4)	23	87.7	107.4	108.6	107.0	19.3	16.3
	Controls (C4)	21	88.1	86.6	93.5	91.1	3.0	

TABLE 2

A LONGITUDINAL 3 YEAR COMPARISON BETWEEN THE EXPERIMENTAL (E5) AND CONTROL (C5) GROUPS ON THE STANFORD-BINET INTELLIGENCE TEST

Group	N	Measure – Stanford Achievement Test – Subtests															
		Word Meaning		Paragraph Mean.		Sc. & Soc.		Spelling		Word Study		Language		Arith. Comp.		Arith. Concept	
		$\bar{X}$GE*	%R**	$\bar{X}$GE	%R	$\bar{X}$GE	%R	$\bar{X}$GE	%R	$\bar{X}$GE	%R	$\bar{X}$GE	%R	$\bar{X}$GE	%R	$\bar{X}$GE	%R
E5	15	2.6	30	2.2	18	2.7	42	2.8	46	2.3	26	2.5	28	2.5	23	2.6	32
C5	20	1.9	10	1.6	2	1.9	14	1.6	6	1.9	14	2.2	14	1.9	8	1.7	6
Diff. between groups		$\bar{X}$GE	%R	$\bar{X}$GE	%R	$\bar{X}$GE	%R	$\bar{X}$GE	%R	XGE	%R	$\bar{X}$GE	%R	$\bar{X}$GE	%R	$\bar{X}$GE	%R
		7	20	6	16	.8	28	1.2	40	4	12	.3	12	6	15	.9	26

* XGE = Mean Grade Equivalent

** %R = Percentile Rank

TABLE 3

A POST 1ST GRADE COMPARISON BETWEEN THE EXPERIMENTAL (E4 & E5) & CONTROL (C4 & C5) GROUPS ON THE STANFORD ACHIEVEMENT I

Groups	N	Measures – Stanford Achievement I Subtests											
		Word reading		Para. Meaning		Vocabulary		Spelling		Word Study		Arithmetic	
		$\bar{X}$ Gr. Score	% Rank	$\bar{X}$ Gr. Score	% Rank	$\bar{X}$ Gr. Score	% Rank	$\bar{X}$ Gr. Score	% Rank	$\bar{X}$ Gr. Score	% Rank	$\bar{X}$ Gr. Score	% Rank
E4	20	1.9	50	2.0e	58	2.1	58	2.5	86	2.1	64	2.3	74
E5	17	1.6	18	1.7	24	1.7	38	2.4	82	1.8	42	2.4	80
C4	17	1.3	2	1.4	4	1.3	8	1.4	14	1.4	14	1.3	6
C5	19	1.4	6	1.4	4	1.4	14	1.3	12	1.5	22	1.5	16
		$\bar{X}$ Diff.	% Rank Diff.	$\bar{X}$ Diff.	% Rank Diff.	$\bar{X}$ Diff.	% Rank Diff.	$\bar{X}$ Diff.	% Rank Diff.	$\bar{X}$ Diff.	% Rank Diff.	$\bar{X}$ Diff.	% Rank Diff.
Diff. bet. Groups													
E4 vs C4		6	48	6	54	8	50	1.1	72	.7	50	1.0	68
E5 vs C5		2	12	3	20	.3	24	1.1	70	.3	20	.9	70
E4 vs E5		3	32	3	34	4	20	1	4	3	12	.1	6
C4 vs C5		1	4	.0	0	1	6	1	2	.1	8	.2	10

ranking than their controls, to a 1.2 year grade equivalent superiority on the spelling subtest, which is a 40 point higher percentile ranking than their controls.

The results of the Metropolitan Readiness Test administered prior to entrance into first grade is presented in Table 5. Compared to their controls (C4 and C5), the E4 and E5 groups scored considerably higher on this test. In terms of grade letter rating, there is one letter grade difference between the experimental and control groups. In terms of percentile rank the E4 group had a 65 point percentile rank difference over the C4, and the E5 group had a 51 point percentile rank difference over the C5 group.

TABLE 4

A POST 2ND GRADE COMPARISON BETWEEN THE EXPERIMENTAL (E5) AND CONTROL (C5) GROUPS ON THE STANFORD ACHIEVEMENT TEST II

Measure	Group	N	Pre-Intervention 1968 $\bar{X}$ IQ Pre-K.	During Intervention 1969 Post-K.	1970 Post-1st	Post Intervention 1971 $\bar{X}$ IQ Post-2nd	Mean IQ Gain or decline over time	After 1 Yr. termination of project differences between groups
Stanford-Binet	Experimental (E5)	21	89.7	98.8	106.2	104.7	15.0	17.5
	Control (C5)	21	89.6	88.0	86.2	87.2	-2.4	

TABLE 5

A COMPARISON OF THE EXPERIMENTAL (E4 & E5) AND CONTROL (C4 & C5) GROUPS ON THE METROPOLITAN READINESS TEST (TOTAL SCORE) PRIOR TO THEIR ENTRANCE INTO 1ST GRADE

Group	N	Measure			
		Metropolitan Readiness Test Total Mean Raw Score	Standardization Norms % Rank	Letter Rating	Readiness Status
E4	22	70.6	82%	B	High Normal, good prospects for success in 1st grade work
E5	17	64.0	69%	B	High Normal, good prospects for success in 1st grade work
C4	14	36.1	17%	D	Low Normal, likely to have difficulty in 1st grade work
C5	20	36.7	18%	D	Low Normal, likely to have difficulty in 1st grade work

Diff. between Groups	Total $\bar{X}$ Raw Score Points Diff.	Percentile Rank Diff.
E4 vs C4	34.5	65%
E5 vs C5	27.3	51%
E4 vs E5	6.6	13%
C4 vs C5	.6	1%

Reading Performance

The Spache Diagnostic Reading Test was individually administered to the E4 and C4 groups at the end of first grade and the E5 and C5 groups at the end of second grade.

On all three subtests the group mean of the E5 children was above grade level while the group mean of the C5 children was below grade level.

The E5 group was approximately one grade level higher than their controls on this test. Of importance are the data revealing that 7 out of 14 C5 children could not read at all, while only 1 out of 14 E5 children had the same problem.

When comparing the E4 and C4 children on the Spache Reading subtests (Table 7), the E4 group mean was above grade level whereas the C4 group mean was below grade level on all three subtests. The E4 reading ability on the three subtests was greater than their controls by one grade level. After first grade, 8 out of 16 control children could not read, while every E4 child was reading at or above grade level.

Academic Performance

Table 8 presents a post second grade comparison between the E5 (one year after termination of the Learning To Learn Program) and the C5 groups on academic Grade Point Average. The E5 group's G.P.A. was .75 grade points higher than their controls, approximately one letter grade difference. The seven academic subtests used to compute the mean G.P.A. were reading, language, spelling, writing, social studies, science, and mathematics.

There were additional results which, while they lack the precision of objective measures, had a substantial influence on the school performance of the experimental (E4 and E5) children. Books were taken home every weekend and were read by the child or to him by his mother or older sibling. The child's work papers—which ranged from one during the latter part of kindergarten to eight in first grade—were read each day to the teacher and then taken home and read again to the parent. School-related work also flowed from home to school. Seventy percent of the children wrote stories, colored

TABLE 6

A POST 2ND GRADE COMPARISON BETWEEN THE EXPERIMENTAL (E5) AND CONTROL (C5) GROUPS ON THE SPACHE DIAGNOSTIC READING TEST

Group	N	Measure		
		Spache Diagnostic Reading Test – Post 2nd Grade (1971)		
		Word Recognition $\bar{X}$ Grade Level	Instructional Reading $\bar{X}$ Grade Level	Potential Reading $\bar{X}$ Grade Level
E5	14	3.43*	3.50*	3.43
C5	14	2.34*	2.06*	2.58
Difference between groups		1.09 $\bar{X}$ Grade Level Diff.	1.44 $\bar{X}$ Grade Level Diff.	.95 $\bar{X}$ Grade Level Diff.

* 7 out of the 14 Control (C5) children were not able to read after 2nd grade, while only 1 out of 14 of the Experimental (E5) children were not able to read.

TABLE 7

A POST 1ST GRADE COMPARISON BETWEEN THE EXPERIMENTAL (E4) AND CONTROL (C4) GROUPS ON THE SPACHE DIAGNOSTIC READING TEST

Group	N	Measure		
		Spache Diagnostic Reading Test – Post 1st Grade (1971)		
		Word Recognition $\overline{X}$ Grade Level	Instructional Reading $\overline{X}$ Grade Level	Potential Reading $\overline{X}$ Grade Level
E4	19	2.63*	2.51*	3.44
C4	16	1.54*	1.20*	1.80
Differences between groups		1.09 $\overline{X}$ Grade Level Diff.	1.31 $\overline{X}$ Grade Level Diff.	1.64 $\overline{X}$ Grade Level Diff.

* 8 out of 16 Control (C4) children were not able to read after 1st grade; while every Experimental (E4) child was reading at or above grade level.

TABLE 8

A POST 2ND GRADE COMPARISON BETWEEN THE EXPERIMENTAL (E5) AND CONTROL (C5) GROUPS ON ACADEMIC GRADE POINT AVERAGE*

Group	N	Measure	
		Academic Grade Point Ave. Post-2nd 1971	$\overline{X}$ Letter Grade Equivalent
		$\overline{X}$ Grade Point Ave.	
E5	17	2.54	C= to B–
C5	19	1.79	D= to C–
Difference between groups		$\overline{X}$ Grade Point Diff. .75	

Code:
A = 4.00
B = 3.00
C = 2.00
D = 1.00
E = 0.00

*The seven academic subjects averaged to compute this mean were reading, language, spelling, writing, social studies, science, and mathematics.

pictures, or cut pictures from magazines to bring to school where they were read and discussed.

In still other ways, the effect, motivation, and cooperation of the parents made an impact on the children's performance and on their attitudes toward school and learning. All the parents asked for books and school work (surplus papers) for their children during the summer vacation. Attendance at monthly parent meetings ranged from 80% to 100%, with some parents having perfect attendance. There was always perfect attendance for individual conferences where the child's progress was discussed with his parent.

The school attendance of the children was just as regular. More than half the children had perfect attendance. Only one child missed as many as 5 days of school the entire school year.

Discussion

The primary mission of this project was to determine and evaluate the effects of exposing groups of poverty children to different lengths of time of a model educational program.

The results of this study indicate that the children who participated in the Learning To Learn Program (E5 for two years and E4 for three years) made significantly greater developmental gains than the control children who participated in traditional educational programs. Both experimental groups (E4-E5) were functioning in the upper limits of the "average" range of intelligence, with a percentile rank of 66 for those who began at age four and a percentile rank of 60 for those who began at age five. When comparing the E4 and E5 age groups to the Negro standardization sample of the Binet their percentile ranks were at the 97th and 98th percentile levels, respectively. The level of functioning of the two control groups was in the "low average" range for the C5 group and the lower limits of the "average" range of intelligence for the C4 group with percentile ranks of 30 and 17, respectively.

It should be pointed out that the E5 group maintained their IQ gain from the Learning To Learn Program one year after its termination. Of equal importance, their Verbal IQ scores were above the 50th percentile rank and within the normal range of intelligence. It is apparent that the Learning To Learn Program has made a significant impact on the intellectual development of the poverty child.

Most encouraging are the results obtained from the standardized achievement tests (Primary Mental Abilities, Metropolitan Readiness Test, and Stanford Achievement Test) administered to both the E4, and C4, C5 groups. On almost all subtests of the three achievement tests the experimental group out-performed their controls. Most impressive is the finding that the E5 children were able to utilize and demonstrate their increased cognitive functioning on measures which, in our society, are predictors of future educational success. There is good reason to believe the same will be true for the E4 children when the follow-up data are analyzed. When making pre-and-post-and-1st grade comparisons between the E4 and E5 groups on the achievement measures, a trend appears that shows the E4 group performing at a higher level than the E5 group.

Language development has been described in the research literature as an area where poverty children show marked deficits. Indeed, the experimental and control children exhibited large deficits in language ability at the onset of this research project. The development of competence in this area is extremely important since academic achievement in our schools is highly related to and dependent on the capabilities of children to (1) express themselves, (2) comprehend written and spoken material, (3) acquire verbal reasoning ability, and (4) develop the ability to handle verbal concepts. The evaluation of the language area reveals some consistent results and some encouraging trends.

The E4 group after the 2nd year of the program demonstrated a superiority in language age over their control group. The data are presented and reported in terms of language age in order to make meaningful comparisons between each group of children and the standardization sample of the Illinois Test of Psycholinguistic Ability (ITPA). It also provides important information as to the language development status of each group in relation to chronological age.

The E5 group's language ability, after two years of the Learning To Learn Program, had improved markedly, while the language functioning of the control group had become more and more impaired.

Mastery of the complexities of arithmetic by the E4 and E5 children has been accomplished in this program. By the end of first and second grades, the E4 and E5 groups of children had the ability to add and subtract and were functioning 6 and 8 mental age months, respectively, above their chronological age in arithmetic abilities. The curriculum and methodological approach of the Learning To Learn Program had apparently succeeded in educating poverty children in arithmetic skills.

An important criterion of whether compensatory preschool programs are effective is a post-program evaluation of academic success in school. One year after termination of the Learning To Learn Program, the E5 group had a C- to B- grade average compared to a D- to C- average for their controls. These grade averages take on added significance in view of the fact that these black poverty children were enrolled in integrated schools in middle-class neighborhoods.

In terms of academic success in school no one ability plays as great a role as reading ability. Both experimental groups show above average reading ability after participating in the Learning To Learn Program, while 50% of their controls cannot read after 1st and 2nd grades. When viewed against the background of reading potential it is of interest to note that—after 1st grade—the E4 children are performing at the same level as the E5 children after second grade. The higher performance of the experimental children who started at age four (E4) in the Learning To Learn Program, compared to the children who started at age five (E5), is currently being studied.

Our current findings, the report of which is being prepared, show a trend which, if substantiated, would represent a major educational breakthrough. The data suggest that it may soon be possible to determine—with considerable accuracy—what kind, how much, and the cost of early childhood education necessary to bring children up to a level of development where they have the educational competence to succeed in subject matter and show attitudes and behavior that make learning possible. For example, a child who begins the Learning To Learn Program at age five and who falls in the 80 - 89 IQ range has a 50-50 chance of reading at grade level at the end of first grade. He has a 90% chance of performing at grade level in arithmetic. But if this same child begins the Learning To Learn Program at age four, his chances of reading at grade level jump to 95 percent and his chances of performing at grade level in arithmetic jump to 98 percent. The data suggest further that children of IQ 100 need only one year of preschool to bring them up to the same level of educational competence.

Certainly this study should be replicated, but the tentative nature of these findings should not detract from their importance. The potential meaning and educational and economic benefits are established in realistic terms instead of using economic status as the criterion. And the data raise hope of the possibility of weighing educational benefit against educational cost.

How have these results been achieved? The substantial gains made by the E4 and E5 children were due primarily to the following innovations:

1. Enlisting the cooperation and participation of the parents to supplement the school curriculum with a "home curriculum." The willingness of the parents to take the time and put forth the effort to help the child can be traced to a change in their attitude about education and their perceptions of their role.
2. Introducing an organized and structured curriculum which provided a flexibility in its use to meet the needs of the teacher and children. For the teacher and child, the curriculum meant guidance with considerable freedom. It provided the teacher with direction and a sense of purpose. She knew what she was doing, why she was doing it, and where she was heading. The flexibility and open-endedness of the curriculum gave her and the children considerable freedom to make maximum use of themselves.
3. Exposing every child every day to learning tasks—at his level—for the purpose of giving him an understanding of the learning process and helping him become aware of and utilize himself in learning.
4. Viewing children as beginning learners with individual differences—rather than children with deficits—helped to shape the teacher's attitudes, expectations, and teaching styles. The emphasis—through teacher training—on the teacher's close identity with the nature of children and their needs permitted her to approach the child with patience, tolerance, trust, and respect.

In summary, by integrating the variables that bear directly on education—the parent, the curricular materials, the child, and the teacher—the Learning To Learn Program developed an educable child who knew how to feel, to think for himself, and to make use of himself to learn. He graduated knowing something about himself and about learning and he felt good about school.

In closing, three anecdotes are most appropriate to sum up the impact of the Learning To Learn Program on the public school, the child, and the parent. All the public school teachers who had Learning To Learn graduates the previous year asked for the new graduates coming into their schools. This is particularly significant in view of the fact that the principal and teachers openly resisted integration of their school. The teacher at this school was glad to waive the racial-balance policy—which was five blacks per class—in order to have all 12 of the Learning To Learn black graduates. Then there was the very personal remark of a parent at her last individual conference, who said, "I have nine children in school and this is the first time I got the feeling the teacher cared about me and my child." Finally, Kevin may have had similar thoughts the last day of school. He got on the bus and sat next to the author, who was driving. After a few minutes of silence he said, "Teacher, I don't know if I am going to like this idea of staying away from school all summer."

Summary of Other Learning To Learn Research

The Learning To Learn School has been engaged in research in early childhood education since 1964. In that time we have accumulated volumes of data on middle class and poverty children who have attended traditional kindergartens,[3] and on middle class and poverty children enrolled in the Learning To Learn Program. We have also gathered information on middle class and poverty children who attended traditional nursery school and kindergarten and compared it with information we have on middle class and poverty children who have been enrolled in the Learning To Learn Program. Some of these data are charted in Tables 1 to 8.

Some major findings of the Learning To Learn School research are:

1. The progress children make in early childhood programs depends on at least five factors: (1) initial level of development, (2) number of years in preschool, (3) kind of program offered, (4) socioeconomic level of the parent, and (5) parent involvement and participation.
2. It is possible to develop early childhood programs where there are affective, language, and cognitive benefits for every child which last and serve him well in the public schools.
3. Only a minority of the middle class and poor children (the percentage of poverty children was very small) showed lasting benefit from conventional nursery schools and kindergartens. Those who benefited were the verbal, intelligent, motivated, curious, and reasonably well adjusted. They were the beneficiaries because the teacher spent most of her time with them. A high percentage of poverty children in those programs failed to make any progress. Of these children, those who needed the most help (nonverbal, slow in development, and not well adjusted) went backward rather than forward.
4. By the end of first grade the educational gap between middle-class and poverty children was wider when the latter were enrolled in conventional preschool programs.
5. All middle-class and poverty children enrolled in the Learning To Learn Program showed substantial gains in affective, language, and cognitive development. The gap in educational competence at the end of first grade between middle-class and poverty children was substantially reduced but is not closed.
6. The impact of the Learning To Learn Program on slow developing children[4]—both middle-class and poverty children — was of considerable educational significance. The program raised their level of competence to the point where they all read and knew arithmetic operations in first grade. By contrast, a matched group of slow developing graduates of conventional preschool programs were, at the end of first grade, non-readers and did not understand the use of numbers.

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[3] A traditional kindergarten is defined as follows: A classroom which contains a wide variety of material things, most of which a majority of middle-class children have been exposed to and are familiar with by the time they reach kindergarten. Children are permitted to move about the classroom freely, select whatever material they wish to use, decide for themselves the time they will spend with it. A teacher makes available a variety of learning opportunities but is not held responsible for seeing that learning actually takes place. Her acitivities in the classroom are low key with respect to educational activities. The child—through his initiative—decides if he wants to take advantage of the learning opportunities and directs the teacher as to when, how much, and what kind of learning should occur.

[4] The lower third of children in the class are considered slow developing. In a class of poverty children the lower third have IQ scores in the 60's, 70's, and 80's. In a class of middle-class children, the lower third have IQ scores in the high 70's, 80's, and lower 90's. In the public schools these children are frequently placed in readiness classes. If they do not progress, they are enrolled in special classes or placed in a slow educational track from which they seldom emerge.

CHAPTER 8.

RESULTS OF A PRESCHOOL INTERVENTION PROJECT[1]

David P. Weikart, Dennis J. Deloria, and Sarah Lawsor

Summary

The Ypsilanti Perry Preschool Project was an experiment to assess the longitudinal effects of a two-year preschool program designed to compensate for functional mental retardation found in some children from disadvantaged families. The program consisted of a daily cognitively oriented preschool program and home visits each week to involve mothers in the educative process. The project was initiated in September, 1962 and the phase covered in this report was terminated in June, 1967.

The population from which the sample was selected was black and economically and educationally disadvantaged. Control and experimental groups were equated for mean cultural-deprivation ratings and mean Stanford-Binet scores.[2] Instruments used to evaluate the project included the Stanford-Binet, the Leiter International Performance Scale, the Peabody Picture Vocabulary Test, the Illinois Test of Psycholinguistic Abilities, the California Achievement Test Battery, several parental attitude instruments, and teacher ratings.

The preschool curriculum which evolved over the duration of the project was derived mainly from Piagetian theory and focused on cognitive objectives. Emphasis was placed on the teacher's flexibility in gearing classroom activities to individual children's level of development. Heavier emphasis was placed on verbal stimulation and interaction, socio-dramatic play, and on field trips than on social behavior and other traditional concerns of nursery schools.

Weekly afternoon home visits provided each family with an opportunity for personal contact with the child's teacher. The mother was encouraged to participate in the actual instruction of her child, thereby increasing her understanding of school, of teachers, and of the educative process. The teacher's child management techniques indirectly taught the mother alternative ways of handling children. Group meetings were used to

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[1] Additional information concerning the research conducted in this project is available in: Weikart, D.P. et. al., *Longitudinal results of the Ypsilanti Perry Preschool Project*. Ypsilanti, Mich.: High/Scope Educational Research Foundation, 1970. Additional information on the curriculum available in: Weikart, D.P. et. al., *The cognitively oriented curriculum: A framework for preschool teachers*. Washington, D.C.: National Association for the Education of Young Children, 1971.

[2] We know now, nine years after the start of the project, that cultural-deprivation scales and the Stanford-Binet can be misused in judging the level of development of children from low-income homes. Nevertheless, the use of these measures at the initiation of this project did allow services for children who met State requirements for participation. At no time have we felt that the Stanford-Binet reflects the genetic potential of the child.

reinforce the changes in individual parent's views concerning the education of children.

The Project involved a series of replications to obtain sufficient numbers for longitudinal study. Since the youngsters attended preschool for two years, a new pair of three-year-old experimental and control groups was added each year to the previous samples. The various groups who attended school for different lengths of time have been designated as "Waves." Wave 0 and Wave 1 started preschool in the fall of 1962. Wave 4, the last wave of this study, began in the fall of 1965 and completed the second year in June, 1967.

The general findings of the project are:

1. Children who participated in preschool obtained significantly higher scores on measures of cognitive ability than control group children. As both groups progressed through school their superior functioning disappeared by third grade.
2. Children who participated in preschool obtained significantly higher scores on achievement tests in elementary school than control group children. This significant difference continued throughout the years of followup, including third grade.
3. Children who participated in preschool received better ratings by elementary school teachers in academic, emotional, and social development than control group children. This difference continued throughout the followup years including third grade.

The conclusion of the study is that preschool programming, at least as represented in this project, is an effective device for improving the general functioning level of disadvantaged black children who were initially diagnosed as functionally mentally retarded.

Sample Description

Ypsilanti is a community of about 50,000 on the fringe of metropolitan Detroit, encompassing a wide spectrum of socio-economic levels. The Ypsilanti Perry Preschool Project was established after several years of preparation and planning. In 1958 and 1959, a series of internal studies of the Ypsilanti Public Schools (conducted by Weikart, then director of the Special Services Department) presented two facts: First, by ninth grade at least 50% of the children attending the Ypsilanti schools were over-age in grade from one to five years; and second, the achievement rate for these children was considerably below average on national norms. It was also found that children in lower class schools within the system had much lower achievement rates and much higher retention rates than did children in middle-class schools. For example, in one lower-class school, 50% of the children had already been retained by fourth grade; the school's standardized achievement rate, averaged over a seven year period, was below the 5th percentile across all classrooms. In contrast, children in one middle-class school had only an 8% retention rate by sixth grade and a seven year standardized achievement rate average above the 90th percentile.

The decision to turn to preschool as a compensatory education method was made on the practical grounds that there was little hope for reform of the school system's educational practices at that time. The present problems confronting efforts toward school reform throughout the nation give some indication of how difficult such reforms would have been in 1962 before the current ground swell of support appeared.

During the five years of the project, 123 children were chosen from the Perry School attendance area for the sample. Of these, 58 attended the preschool (the experimental group) and 65 did not attend the preschool (the control group) but participated in annual data collections. Each fall the project's staff used school census data to locate all families in the Perry School area with three-year-olds (and four-year-olds in the preschool's first year of operation). These families were then interviewed to determine which ones had low scores on a disadvantaged index (CD Ratings) which gave equal weight to the educational level of the parents and the occupational level of the father (and mother if employed), and half weight to household density. The Stanford-Binet Scale was administered to all children whose families' CD ratings were below 11. Those children scoring in the educable mentally retarded range (Stanford-Binet scores between 50 and 85) with no organic impairment were assigned to the experimental or control samples. This process was essentially random, although the groups were matched on CD ratings and Stanford-Binet scores. In addition boy/girl ratio and percentage of working mothers were balanced when possible. The mean values for the complete Ypsilanti Perry Preschool Project sample on these "sample selection variables" were as follows: mean chronological age at entry to the project was 42.3 months; mean CD rating was 8.4; and, mean Stanford-Binet score was 79.0. For the additional variables on which the groups were matched when possible, the total sample had 71 boys (58%) and 52 girls (42%), and 35 children (28%) had mothers who worked outside the home.

Family structure. Slightly over half the children live in families where the fathers are present. About one-fifth live in some sort of extended family (i.e., persons or relatives besides primary family members live in the home). The average number of children in the samples' families is about five, but this is a widely dispersed distribution (standard deviation of 2.5). Again, considering the average case, most children come from families where there is one younger sibling and three older ones.

Parent age, birthplace (mother), and education. The mothers' and fathers' ages when their children entered the sample both averaged around 30 years. Mothers' ages ranged from 18 to 48; fathers' ages ranged from 22 to 52. The average number of years of school completed by the parents was a little over nine years. Again there was a wide range (3 to 12 years of education) with 11% of the mothers and 12% of the fathers having attended school for 12 years. Of the approximately 70% of the mothers born in the South, about 45% were also educated in the South.

Parent occupational status. Of the 65 children in the sample whose fathers lived with the family, about 85% had fathers who were employed at the time the Demographic Questionnaire was administered. Most held unskilled jobs, with only two in jobs classified as managerial (one supervisor at a laundry and one local union president). The most frequently held jobs were janitors, construction laborers, and workers on automotive assembly lines. In many cases, the mothers (who generally answered the questionnaire) were unsure of the fathers' work.

About 28% of the children had mothers who worked outside the home. Those jobs which were classified all fell within the unskilled category. The most frequently named jobs were maids, laundry workers, and domestics. Other mothers were store clerks, nurse's aides, cooks, waitresses, and dishwashers.

Source of family income. Half the sample lived in families who received some sort of public assistance (welfare, ADC, etc.). Of the 65 children living in families where fathers were present, 21% had both parents working, 61% had only their fathers working, and 14% had neither parent working. Of the 58 children living in fatherless families, the mothers were employed 36% of the time.

Description of physical home environments. The average size of the children's homes was about six rooms. Density of persons in the homes (rooms per person) averaged 0.8. Summarizing data from teacher home visit reports written over the 1964-65 school year (visits to 21 experimental families), about 50% of the families lived in public housing, about 30% lived in houses converted to apartments, 10% lived in apartment buildings, and about 25% lived in private homes. In general, the teachers considered the homes to be clean, comfortably heated, lacking unpleasant odors, and no unusually noisy. The only common negative teacher rating was for illumination in the homes: 25% were rated "fair," and 50% were rated "poor."

Curriculum

The Cognitively Oriented Curriculum, based on the theories of Piaget, was designed to help the child construct the mental representations of himself and his environment that lead to the development of logical modes of thought. Although many of the activities and materials used are basically the same as those used in most nursery schools, they are used in more specific ways. Teachers first define the goals of cognitive development and then select activities appropriate to the child that will best meet these goals.

The curriculum is based on a three-part theoretical framework: four content categories (classification, seriation, spatial relations, temporal relations); three levels of representation (index, symbol, sign); and two levels of operation (motoric and verbal).

Content. Through grouping, or *classification,* the child learns to recognize likenesses and differences among objects and to group them in various ways: objects that are used for the same activity, such as a spoon and a fork; objects that have similar qualities such as size, shape, or color; objects that belong to the same general category, such as food or furniture. In ordering, or *seriation,* the child makes comparisons and arranges objects in order by size, quality, or quantity. He learns to describe objects in the classroom using terms such as "big" and "little," "more" and "less," "rough" and "smooth." Matching and other activities develop the concept of one-to-one correspondence. An understanding of *spatial relations* is developed by pointing out the position of the child in relation to other objects through the use of prepositions of position (in, out), prepositions of direction (to, from), and prepositions of distance (near, far). To understand *temporal relations,* the child learns that time periods have a beginning and an end, that events can be ordered, and that time periods can vary in duration. Throughout the curriculum, the child's daily routine is organized to reinforce these temporal concepts of first, last, before, after, and next. Any given activity emphasizes only one concept so that the child can focus on and master this concept.

Levels of Representation. The levels of representation outlined by Piaget describe the stages which children go through as they learn to think in an increasingly abstract and complex way, each level providing the basis for the next higher level. Since experience with real objects and events is the basis for the developement of higher levels of representation, the cognitive curriculum provides opportunities to see and use a variety of real objects both in the classroom and through short walks or field trips.

As the child gains experience with the real object, he learns to operate on the *index level*; that is, he can mentally construct the object when only part of it is seen, when a part is missing, or when it is perceived through senses other than sight. In order to provide a link between the real object and this first level of representation, the materials and equipment used are as realistic as possible, for example, rubber animals or model cars and airplanes. From looking at the wing of a toy airplane, the child might be asked to guess what the whole object is; or the teacher might devise a mystery bag game in which the child identifies objects in a bag through the sense of touch.

At the *symbol level* the child's mental images become strong enough to enable him to deal with representations of objects that are distinct from the objects themselves. Included at this level is the use of the body in representing objects and events; a child might pretend he is a dog by walking on all fours and saying, "bow-wow, bow-wow." The child can also make models of objects from art materials such as clay; use objects to represent other objects, such as a cup for a pail; recognize objects shown in photographs and drawings; and make his own drawings.

The final level, the *sign level,* is representation through words. In the cognitive classroom students are encouraged to verbalize, but the teachers do not teach concepts verbally. Through involvement with objects and people, the child is provided with the kinds of experiences at earlier levels of representation which will support later development at the sign level.

Levels of Operation. The third component of the framework deals with the motoric and verbal levels of operation. Very young children generally interact with their environment with their bodies – the motoric level – and gradually develop the ability to interact with words – the verbal level. The cognitively oriented curriculum assumes that children learn through physical interaction with their environment and tries to expose them to a variety of materials and equipment to teach concepts by both physical and verbal experiences. The child is given the opportunity to squeeze, drop, cut and float materials; use his body to run, jump, and climb; and move under, over, or around something. Meanwhile, the teacher explains verbally the child's physical experiences and encourages his use of language.

GENERAL METHODOLOGY

There were essentially four independent variables investigated, but the last two actually consisted of many smaller variables; first, preschool versus no preschool, the experimental treatment; second, boys versus girls; third, selected home background variables; and fourth, entering year cognitive variables were considered to be independent variables for use in some analyses.

Preschool, The Experimental Treatment. The main independent variable was participation in two years of preschool for experimental children, contrasted with no treatment at all (beyond annual testing) for the control children. Experimental children attended preschool half-days, five days a week, from mid-October through May. In addition teachers visited each experimental child in his home for a ninety-minute instructional session once every week during the school year.

Five pairs of experimental and control groups were used in five replications of the basic experiment, so as to guard against unusual circumstances in any single year that might contaminate the findings. For convenience, each of the five pairs of experimental and control groups was called a "Wave," and given a number from 0 through 4. Wave 0 and Wave 1 entered together in 1962, and a new wave entered each succeeding year until 1966 when a comparative curriculum project was initiated.[3] The Wave 0 children were distinguished from Wave 1 children because the former entered the project at age four, the latter at age three. Thus, Wave 0 experimental children went directly into kindergarten after one year of preschool, while Wave 1 experimental children and all successive Waves attended two years of preschool before entering kindergarten.

Originally Wave 0 was designated a pilot wave, to be used for establishing a workable curriculum before the test waves began, and also as "senior preschoolers" to

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[3] Curriculum Demonstration Project, Ypsilanti Public Schools.

Wave 1. However, since there were more longitudinal data on Wave 0 than on any other wave, it was included with the later waves in this report. This decision posed some difficulty in grouping the waves for combined analysis, since all waves except Wave 0 began at age three and participated in two years of preschool. The matter was resolved by overlooking the starting ages of the children and grouping the preschool *entering-year* data for all children and grouping the preschool *second-year* data for all children (except, of course, for Wave 0 who had none), grouping the *kindergarten* data for all children, and so on. This move seemed justified because test results for the initial preschool year were very similar for all children regardless of their ages.

From year to year there were changes made in the preschool curricula which apparently affected the experimental group data. These changes evolved as the experimenter's knowledge of effective instructional techniques grew, rather than being systematically manipulated changes, so the decision was made not to formally distinguish among waves because of variations in their preschool experiences.

Following completion of preschool for the experimental groups each year, both experimental and control children entered the regular public kindergarten for the Perry School District of Ypsilanti, Michigan, just as the children would have done if no intervention had occurred. No effort was made to alter the elementary school curriculum in any way, and no effort was made to assign children to particular teachers. In short, after the completion of preschool, absolutely no further intervention occurred other than the annual testing of both experimental and control children. Elementary teachers were not informed of the identity of control or experimental children, and most of them had little or no knowledge of the aims and procedures of the experimental preschool. It should be pointed out, however, that when classes began kindergarten teachers could usually identify experimental children by their classroom comments about preschool experiences.

Home background variables. Home background data were collected using the Cognitive Home Environment Scale (CHES), Inventory of Attitudes of Family Life and Children (Inventory), and Perry Demographic Questionnaire.

Classifying some of the home background variables as either independent or dependent variables was difficult. Data from some home background variables were relatively unaffected by the experimental procedure, including variables such as the cultural deprivation rating, parent's age, older and younger siblings, size of house, and so on. However, it was theoretically possible for some home variables to change during the course of preschool because of the increased involvement of parents with teachers and examiners. Examples of this type of variable are parent's attitudes toward education, availability of educational materials in the home, and parent's image of teachers. Because of this, it was not clear whether these variables properly belonged with the dependent variables or with the independent variables, but a decision was arrived at by or with the independent variables, but a decision was arrived at by necessity: most of these measures were taken after the start of preschool, that is, after the hypothesized changes would have taken place, so they were treated as independent variables in spite of indications that they might have been somewhat dependent upon the experimental treatment.

Birth Variables. Data on medical birth complications were collected for a subsample of 101 of the 123 Perry Project children, including information about both the mother and infant. The maternal variables included pregnancy complications (such as hypertension, toxemia, etc.), and delivery complications (Caesarian section, breech delivery, etc.). Infant variables included birth weight and natal complications (delayed respiration, convulsions, etc.). These data were collected from hospital records in the followup phase of the project, after all children had completed preschool.

Data Collection

In order to identify eligible children each year, names of all three-year-old children living within the Perry School District were taken from the public school census. Then parents of each child were visited by one of the preschool teachers to obtain the information necessary to calculate as a CD rating for the family. A second visit was made to all families falling below the CD rating cutoff point to get permission to test their children with the Stanford-Binet. For those falling below the Stanford-Binet cutoff point, assignment to either the experimental or control group was made, and teachers notified parents of the status of their children and obtained final permission. At this stage there were only about three refusals over the five-year period of the project.

The annual testing was performed by qualified testers who had completed formal training in the administration of individual intelligence tests. In the interest of keeping data collection as objective as possible, outside testers who knew little about the project were hired for several weeks each spring. Typically these testers were advanced doctoral students studying educational psychology at the University of Michigan. During the earliest times, and from time to time, thereafter, it was necessary for staff testers to assist with test administration, but insofar as possible testing was left to neutral outsiders.

To inform testers about their role in the project, one or two presessions were held in which a project staff member explained the testing procedures and the importance of objective and unbiased participation. Each of the tests was discussed, item by item, to refresh testers' memories and clarify potential areas of difficulty. For all children, both experimental and control, testers were instructed to develop good rapport with the children, and to make conditions as favorable as possible within the limits of standardization so the children would be encouraged to make their maximum possible score. In keeping with this instruction, children who tended to give up quickly were to be reassured by the testers and encouraged to keep on trying until the testers were convinced that the children had performed as well as the situation allowed. Children who for one reason or another were untestable on a scheduled day were to be rescheduled for another attempt.

To minimize the possible confounding effects of tester differences, children from both experimental and control groups, from different waves, from both sexes, and so on, were assigned to each tester in as balanced a manner as possible within the ever-present scheduling constraints. Testers were not informed whether the children assigned to them were experimental or control, but often the child himself or the circumstances of the test would indicate which group individual children were in. Since the testers were predominately outsiders, however, even if they did learn the status of particular children they had little interest in whether the results were favorable to the project or not.

All of the children in the Perry Project were black, but few of the testers were black. Although this may have had an effect on the *absolute* level of scores obtained, *relative* differences between the experimental and control groups should not have been affected because children were assigned to testers in a balanced manner. Data analyses were based almost entirely on comparisons of the *relative* performance of experimental to control children, minimizing the importance of possible racial tester effects. Early in the project this problem was investigated statistically and no significant tester differences were found.

The four cognitive tests employed by the project were given in two sessions, with the Peabody and Stanford-Binet typically paired for one session, and the Leiter and ITPA paired for the second. The Peabody and Leiter tests helped establish rapport quickly, and the total length of each session was easily manageable by most of the children. Although capable of being administered by teachers to entire classes, the California Achievement Tests were administered by trained testers to groups of six or less. The child rating scales used to collect socio-emotional data were completed by teachers near the end of each school year. Results of the tests were not released to parents or teachers, but only to school diagnosticians or other qualified persons who requested information about particular children.

The follow-up rate of project children in the longitudinal evaluation has been very high. In the last data collection, over 90% of the original sample were once again tested. The unusually high follow-up rate can be partly attributed to the research staff's determination to include all children who could be located (involving tests as far away as Boston or California) and partly attributed to the relatively low mobility of the people living in the Perry School District during the years in which the project was conducted. In recent years there has been a noticeable trend toward increased mobility, making longitudinal follow-up more difficult. The investigators intend to follow the Perry Project children through high school, and into adult life if circumstances permit. Tests beyond the third grade are scheduled at progressively less frequent intervals.

Endings

The findings of the study, specific to the population from which the sample was drawn, support the value of preschool education. The statistical analyses on which these findings are based are presented in the longitudinal report cited above. At the time of this report not all children had reached the upper grades, rendering the conclusions somewhat tentative. Results from each of the three major areas are as follows:

1. *Cognitive effects.* Children who participated in the preschool program experienced significant and immediate improvement in cognitive functioning as measured by such standardized tests as the Stanford-Binet, Leiter International Performance Scale, Peabody Picture Vocabulary Test, and the Illinois Test of Psycholinguistic Abilities. This significant improvement in functioning continued through three years of schooling. It disappeared at the point at which the control group children had improved sufficiently to offset the early advantage of

the experimental children. That is, the control groups gradually improved their performance while the experimental groups, after rapid initial gain, gradually declined; thus, during the second grade the significant cognitive difference disappeared. There were few sex differences on the cognitive tests except with the Peabody Test, on which the boys generally scored higher than the girls. In general, the scores on the Leiter, a nonverbal, concept reasoning test, tended to be 5 to 10 points below the Stanford-Binet. Scores on the Peabody Test, a vocabulary comprehensive test, tended to be 15 to 20 points below the Stanford-Binet.

2. *Achievement effects.* Children who participated in the preschool performed significantly better on the California Achievement Test in the first, second, and third grades than did the control group children. It is important to note that this advantage was derived primarily from the performance of experimental girls. Of all the areas measured in this project, the performance of the children on achievement tests was seen as the most important. The primary purpose in establishing the preschool was to prepare children to procure an education from the schools by gaining the necessary skills to operate in the classroom. The better performance of the experimental children on the standardized achievement test indicates that to a certain extent at least, the goal had been reached.
3. *Socio-emotional effects.* Children who participated in the preschool program were rated by elementary school teachers as being better adjusted and showing more academic promise than control children. It should be noted that while there is less evidence of support or experimental group performance on socio-emotional factors in the third grade, the trend is still present. At the time the Perry Project began, there was considerable concern on the part of nursery educators about the "pressures" a program as structured as the Cognitively Oriented Curriculum would inflict upon the children. There were dire predictions of permanent emotional damage to the experimental children. According to the data collected during the project, teachers apparently feel that children experiencing the "pressure" of this preschool program are, in their view at least, better off for it during the four years after preschool.

Discussion

Whether or not this preschool project will be successful in reaching its long-term goals of improved academic achievement for the participating children cannot be answered without further data. At the present time, a number of factors can be listed as essential to its success so far.

1. *Curriculum.* The curriculum employed in the Perry Project was derived primarily from the child development theories of Piaget. While the ideas of other theorists such as Smilansky were utilized for specific portions of the curriculum, the organizing concepts were drawn from Piaget. The use of a theory-based curriculum permitted commitment to a specific framework which sets limits for classroom operation and provided a challenge to teachers to select appropriate activities, to match their program with desired outcomes, and to direct the total classroom operation toward support of the theoretical goals. The necessity for the staff to work within a framework was important to the success of the project primarily because of the discipline and focus it provided, and because of the on-going opportunity for open staff discussions about both theory and practice. A theoretically based curriculum helps to bring all staff together as a team attempting to solve a complex problem rather than separating them into one group with information and another group without information.
2. *Planning.* All teachers had to prepare lesson plans based upon the specific goals of the curriculum at least a week before they were to be used. In order to do this, the teachers had to understand the theoretical basis of the curriculum and how to adapt it to the individual child. Planning forced specific attention to the use of time in the classroom and the particular goals of classroom activity. Planning provided an opportunity for a constant review of curriculum effectiveness. Also, it was the most difficult thing for the teaching staff to do because of the amount of time and energy required for adequate planning.
3. *Team teaching.* The four teachers taught as a single team for all but the last year of the project; at that time, two groups of two teachers each were organized. The teachers taught during the entire time they were in the classroom, avoiding serial teaching. It took a constant effort to develop

activities and to solve problems within the theoretical framework of the model that reflected the best thinking of the team.

4. *Commitment.* In order to meet the expectations of the project by fulfilling the requests of the research staff and by being effective in the classroom, the teachers had to spend time over and above regular teaching time to stay ahead of the demands. Lunch hours, after school, and "break times" were often employed to prepare lessons, write reports, and meet with various staff members and visitors. This type of involvement came from a firm commitment to the program. It meant that the program operated in each classroom was a direct expression of the individual teacher's work, rather than something routinely applied.
5. *Supervision.* The teaching team was supervised by an experienced teacher who was familiar with preschool classrooms and a member of the research staff who was familiar with the theory. The focus of the supervision was on providing clear orientation to the project goals and on "referencing" problems of operation within the team. Rather than simply smoothing over problems, the supervisory staff worked with the teachers to help them face the issues and reach solutions which were within the theoretical framework of the curriculum model. The supervisory staff also provided in-service training for the teachers. Although the supervisory staff was not authoritarian in operation, it was clearly responsible for helping teachers keep to the instructional problems at hand.
6. *Respect for the individual.* The project was operated as a group of professionals working to produce information. While this group operation ideal often broke down, the project attempted to keep all staff members in communication. This interaction gave each staff member an actual part in the development of the total project.
7. *Involvement of the mother.* The classroom teachers made home teaching visits to all of the children participating in the project. These visits were designed to actively involve the mother in the process of education. While group meetings were held about once a month and some preschool observations were scheduled, the primary focus with parents was the educational activities in the home. The mothers responded well to these visits and increased their cooperation in this aspect of the program over the period they received visits. The home visits provided powerful supportive action for the child.
8. *Focus on the child.* In order to prepare for the weekly 90-minute home teaching sessions, the teacher directed her attention to the particular problems of the child she had seen on past visits and in the classroom. Upon returning from the home visit, the teacher wrote a report on her observations. The home teaching sessions, therefore, provided an unusual opportunity for the teacher to focus upon the learning problems of each child. This knowledge was carried over into the classroom instructional program.
9. *Focus on education.* The project did not have professional staff other than teachers and research personnel. It did not offer social work services, health services, referrals to clinics or agencies, or other supplementary services. The teachers and the project families saw the teacher's role as clearly educational in nature. This single-purpose approach is practical in southeastern Michigan because the services of the many agencies are readily available.
10. *Language.* The heavy use of language in the classroom with the students and on home visits with the mothers and children was essential to the operation of the project. While the method of teaching language varied greatly throughout the project, the requirement that the teacher maintain a constant verbal communication pattern with each child, even when he would not respond, was an important characteristic of the project.
11. *Operation of a model program.* In the operation of a research model program, the expectation of the staff is high. The constant stream of visitors and consultants and the high rate of outside criticism creates an artificial situation. What was done, how well it was done, and how it might have been done better are constant questions that the staff of a research project learns to live with, and such questions help keep the quality of performance high. Any interpretation of the results of the Perry Project must take into account the pressure inherent in a research project for quality performance by all personnel.

In summary, the Perry Project was successful for three basic reasons. First, the project included extensive opportunity for each teacher to think about the children she was serving. Home teaching, small classes with a reasonable number of children, report writing, and constant discussions of how to help a specific child grasp a concept were among the many things that resulted in teacher-child interaction. The result of these extensive experiences with each child is that teachers will treat the educational development of a young child effectively if they can evolve an intimate knowledge of how a specific child learns and responds through direct experience with that child.

Second, the project provided a meaningful way for mothers to be included in the educative process. The importance of the mother in educational attainment is well known. Bringing the teacher into direct and weekly contact with the mother provided the opportunity for extensive development of supportive educational skills on the part of the mother. While the data show that the preschool mothers alter their actual teaching behavior to resemble mothers who teach their children successfully, the home teaching process is not as much a transfer of information or experience to the mother as the creation of an atmosphere of support for intellectual growth in the home.

Third, the project operated in such a way that each staff member was creatively involved in the total operation. The adoption of a theoretical framework does not diminish the opportunity for participation on the part of the staff. While the degree of involvement varied from year to year, the more effective the program became.

While the follow-up data of the project are not complete at this time, preschool programming as represented in this project seems essential if disadvantaged children are to perform well in regular public school classrooms. Some, but not all, of those who participated in this preschool became able to operate in regular educational programs as normal achievers. Most, but not all, of the control group without preschool training were unable to profit from regular education as evidenced by very low achievement test scores. In general, it seems that children from the groups served by this project do not succeed without preschool assistance. At this time, preschool attendance seems an effective method of compensating for the deficits these children bring to the educational process.

The boys who participated in the project were less responsive to the program. There are many possible reasons for this, such as the higher incidence of birth complications and different socialization practices. However, further investigation should be made to discover what steps may be taken to correct the situation. Many preschools are including male teachers and para-professionals whenever possible. Further adjustment in curricula must be made for boys, and specific attention must be given to this problem.

Although some of the children who have participated in preschool are able to perform well in the elementary grades, not all of them are successful. The downward drift in measured cognitive ability as the preschool experimental group progressed through school signals the reduction in environmental support available to the child. Preschool has simply established the potential for later achievement, and elementary school curricula will have to be modified so that this potential may be realized. The national Follow Through program is one current effort in this direction, though the program is too new to report any long-term results.

There have been many myths created over the years about education in general and preschool education in particular. Apparently children are very much the creatures of their environment, i.e., the environment society has provided. Instead of retreating to explanations of functioning in terms of genetic ability, learning styles, learning disabilities, or any of the other jargon used in discussion of children in the early 1960's, current successful programs for the education of young children must be given a chance. The question is no longer whether children *can* profit from a quality preschool experience, but whether we will provide it.

OVERVIEW

Sally Ryan

Is There Any Impact on School Performances?

All of the articles have reported an immediate impact of preschool intervention on a short-term basis. Although there is some variance in the age at which the child initially received intervention—some starting at three, some at four, some at five—there is a change in the child's development as measured by one year pre-post testing. Unfortunately, there are very few instruments which measure other than general intellectual development at the preschool level. Indications of changes in attitude or in achievement motivation are most often described, therefore, in terms of observational report.

In every case, children who were tested using the Stanford-Binet Intelligence Scale showed a significant gain in IQ score when compared to a control group of children from similar backgrounds who did not receive intervention. This finding holds for children starting the program at three, four or five. For example, in several investigations Abelson reports significant IQ gains in children attending Head Start classes but no gains in neighborhood children who were not in the program or in any other program. Herzog found similar gains in a group of three-year-old children of low socio-economic status who were enrolled in a two-year preschool at Howard University. At the end of the nursery school program, the mean IQ score was significantly above that of the control group. Again, Weikart reports significant and immediate improvement in cognitive functioning as measured by the Stanford-Binet, Leiter International Performance Scale, Peabody Picture Vocabulary Test, and the Illinois Test of Psycholinguistic Abilities in a group of three-year-old disadvantaged children who received two years of nursery school intervention as compared to control children with no nursery school experience. In Deutsch's program, the disadvantaged nursery school children were housed within the public school's physical plant; at the end of one year of nursery school and prior to entrance into kindergarten, the experimental four-year-old children scored significantly higher on the Stanford-Binet Intelligence Scale (Form L-M) and the Peabody Picture Vocabulary Test than their controls who were starting kindergarten with no previous preschool experience. In this program children improved their performance on those tests that were designed to tap general cognitive and language skills. Similarly, Sprigle found significant IQ gains in five-year-old children who first received intervention at the kindergarten level as compared with control children who received no intervention.

Several other types of behavioral development may be affected by intervention; these behaviors are not usually tapped by standardized measures. As a result of preschool intervention Abelson reports an immediate positive impact on the child's adjustment to school. She suggests that the more optimal intellectual performance following nursery school experience may be due partly to changes in affective-motivational reactions to testing. In addition, Beller reports that the timing of intervention had a direct effect on the patterning of motivational and socio-emotional variables which prove to be essential in the socialization of orientations toward intellectual competence and academic achievement. He indicates that one of these motivational variables, that of the level of autonomous achievement striving, is not only itself affected by early educational intervention, but also acts as an important indicator of which children suffer more and which least from the lack of preschool experience.

In summary, the studies presented here indicate that at the preschool level a one- or two-year nursery school program does have an immediate effect on the development of the child. Moreover, intervention has an immediate impact regardless of the particular age at which it is introduced. Although the most frequently reported gain is the significant rise in IQ points, Abelson's and Beller's results suggest some gains on the personal-social adjustment of children as well.

Although intervention programs do exhibit immediate positive impact, does this preparation help children to perform better in school? The question of whether intervention programs have more than a temporary impact on the development of inner city children has been approached here by longitudinal analyses of the children's subsequent performance in school.

In most cases the reports find that nursery school intervention does have a sustained effect which can be measured during the school years. However, this conclusion must be made conditional on the view so clearly stated by Gray: "An effective early intervention program for a preschool child, be it ever so good, cannot possibly be viewed as a form of innoculation whereby the child is immunized forever afterward to the effects of an inadequate home and a school inappropriate to his needs."

School performance defined in terms of cognitive-linguistic skills did seem to be significantly affected by early intervention programs. When a one-year early intervention program emphasizing self-paced independent learning was placed in the physical school plant, Deutsch reports that all four waves of experimental children scored significantly higher than the controls on Stanford-Binet and the Peabody Picture Vocabulary Tests at the end of kindergarten and third grade, on the Lorge-Thorndike Intelligence Tests at the close of first and second grade, and on a reading prognosis test given at the end of kindergarten. Deutsch states that although the dramatic form of gains of the preschool years were not repeated in the grades, experimental children did remain more advanced with respect to their age peers in the same schools. According to Gray, disadvantaged children placed in two- and three-year summer intervention programs, in which activities were sequenced over time in small group settings, also showed continued but small gains in public school. Home visits to work with mothers provided a bridge for the child from one summer to the next. The difference between experimental and control groups at the end of fourth grade on the Stanford-Binet was still significant, although modest.

In a two-year intervention program which focused on cognitive objectives, Weikart reports that the significant superiority of the experimental group over the control group on various tests disappeared by the end of the second grade. Their advantage in gain disappeared at the point where the control group had gained enough in score to offset the experimental group. The fact that only Deutsch's population seemed to sustain moderate gain increases may be related to the fact that both Gray and Weikart's population shifted into public school without the continuance of the same curriculum type, whereas Deutsch's population had the benefit of continutiy of the intervention curricula in public school as well.

That the type of public school curriculum may affect the amount of early intervention impact is reflected in Abelson's longitudinal study of Head Start pupils in Traditional and Experimental (Follow Through) school programs. The author compared the performance of low income children in a Follow Through program which emphasized individualized instruction with a similar sample of children in traditional inner city schools. Some of the children in each type of public school had attended Head Start and some had not attended Head Start (or any other early intervention program). Peabody Picture Vocabulary gains in first grade were found to be significantly related to the type of public school program which the children were attending. In Follow Through, Head Start children showed increased gains in kindergarten and first grade, whereas Head Start children in the neighborhood schools showed no increasement during first grade. Similarly, non-nursery school pupils in Follow Through showed increased gains whereas, non-nursery school children in neighborhood schools showed no gains after kindergarten.

Abelson's data does seem to indicate that early intervention impact may be enhanced or attenuated by the type of followup the child receives in public school.

Karnes suggests that different types of early intervention curricula may also affect the continued intellectual performance of the child in the same type of public school. Karnes compared the effects of a cognitive based curriculum consisting of sequential model lesson plans which include specific behavioral (cognitive, social and emotional) objectives and criterion tasks with the effects of a traditional preschool curriculum on low income children. As measured by the California Achievement Tests, the children in the Karnes program performed significantly ahead of the children in the Traditional program on the Reading Achievement Section through the completion of the third grade. Karnes suggests that her early intervention program exhibits permanent impact because it is based on a set of theoretical assumptions which have been developed to the point where goals and objectives are clearly specified.

Herzog indicates that certain characteristics of the children in the program may also differentially affect program impact on school performance. In Herzog's study, children were provided with an experimental program from two years of nursery school through second grade; at the completion of second grade, the experimental group entered regular classes of the public schools. The mean Stanford-Binet score of the experimental group was maintained significantly above that of the control group through kindergarten. After kindergarten, both experimental and control group scores declined until at the end of second grade, difference was non-significant.

In Herzog's analyses, three variables show strong and systematic relationships to patterns of IQ scores: sex, initial IQ (IIQ) and socio-economic status (SES). Although all of the children were classified as a low socio-economic group, they were reclassified into higher and lower classifications within this group according to mother's education and person-to-room ratio. When the inter-relations among these three variables are considered, several significant patterns emerge.

Herzog reports that within the experimental group, children who were classified as high SES, but having low initial IQ, exhibited the highest IQ mean score of any sub-group and by the end of the second grade declined the least in IQ points. At the end of the second grade the experimental children with high SES and low initial IQ rating had significiantly higher mean IQ scores than the control high SES low initial IQ children. Within the experimental group at the end of second grade, high SES-low IIQ children had significantly higher mean IQ scores than low SES-low IIQ children; this seems to indicate that when initial IQ is low for both groups, it is the relative socio-economic level within the low SES category which affects IQ gain. Moreover, Herzog suggests that when sub-groups are classified as high in either SES or IQ they are likely to resemble those rated high in both, more than they resemble those rated low in both. Similarly analysis for various sub-group means in relation to sex have indicated that there is a greater dependability for initial IQ scores to predict later outcome for girls than for boys.

Sprigle also suggests that the characteristics of the child may affect program impact. He predicts that the initial IQ of the child will determine how many years of preschool are necessary to bring him up to educational competence at the end of first grade. Where a child who falls in the 80-89 IQ range has a 50-50 chance of reading at grade level at the end of first grade if he enters the Learning To Learn school at age five, his chances of reading at grade level at the end of first grade jump to 95 percent if he begins the Learning to Learn Program at age four.

With regard to the impact of early intervention programs on the subsequent intellectual performance of the child, alternative conclusions seem available. Positive impact in school performance in the form of the experimental group's significant IQ gain over the control has been reported by Deutsch, Sprigle, and by Gray; Weikart also reports a significant difference, but one which disappears by the third grade. One difference between Weikart's program and that of Deutsch, Sprigle or Gray is the latter three provide some type of continuance into public school, either in the form of curricular or parent home training, whereas Weikart's does not. The difference in curriculum orientation between the intervention program and the regular school curriculum may be important; one might suggest that continuity of intervention into public school may sustain gains.

Abelson finds that the type of primary school program provided for children after they leave Head Start determines whether or not Head Start IQ gains would be maintained beyond kindergarten. When the type of public school program was held constant, Karnes' data suggests that the quality of impact may be affected by the type of preschool curriculum used in the intervention program. Moreover, Herzog, who did not report overall longitudinal impact in terms of intellectual gains, did report that sub-group analysis indicates relative socio-economic status to be important in determining gain.

Early intervention programs also seem to affect school performance with respect to academic achievement. In all cases, early intervention children showed significant superiority in achievement tests over the same period of public school in which such superiority was evidenced on the Stanford-Binet. Moreover, Karnes' and Weikart's findings using the California Achievement Test, and Herzog, using the Metropolitan Achievement Tests, seem to indicate that intervention children perform significantly better than controls even after differences in IQ were no longer found.

Deutsch, Weikart, Karnes, and Herzog independently report that children who have had some form of early intervention experience perform significantly better on achievement tests at the third grade level than do control children. Moreover, although significance on a particular achievement subtest varied as a function of the particular program, most programs do report significant differences in the area of word knowledge and reading. Deutsch reports the experimental groups performed significantly better than the controls on the problem solving and concepts score of the arithmetic subtest of the MAT as well. Using the MAT, Gray also reports that the second grade intervention children performed significantly better than the controls on tests of word knowledge and reading.

Although social attitude and adjustment measures are difficult to obtain on young children, there is observational data to indicate that following early intervention, children perform better in public school than their controls. According to Abelson, analysis of 50-item Operation Head Start Behavior Inventory ratings indicated that throughout the kindergarten year, boys and girls were rated higher on leadership, and non-Head Start boys were rated as less independent.

Weikart similarly reports that in the first grade, experimental children were rated as being better adjusted and showing more academic promise than control children.

In addition, Beller reports that children who had the benefit of intervention at the nursery school level showed changes in greater self confidence and increased trust when compared to children who were not exposed to the educational process until they had entered first grade.

Karnes suggests that a structured preschool program when compared to a more traditional program, significantly enhanced children's functioning in social development. At the end of the children's kindergarten year, Karnes asked public school teachers to rate all of their children in the area of social development and work habits and attitudes by means of a brief questionnaire. In the area of social development, the teachers rated the children who had attended the Karnes' preschool significantly higher than the children who had attended the Traditional preschool in two items, one relating to the child's confidence in approaching new tasks, and the other relating to the child's self-concept. In the work habits and attitudes section the teachers rated the Karnes' children significantly higher on all items, reflecting the child's confidence and enjoyment in the learning situation.

Springle reports that the school experience of the experimental children meshed easily with the home experience. Children brought books home to read, and wrote stories to bring to school. Parents asked for materials for their children during the summer months, and participated regularly in monthly parent meetings. More than half the children had perfect attendance in school.

The effects of the intervention program spread to the community as well as to the family of the child. According to Deutsch, parents have communicated their positive feelings about the program to community aides and to other parents. Older siblings have brought their friends in to observe their younger brothers working. Moreover, Gray indicated that when younger siblings of her experimental children reached a testable age, she found that the younger siblings of the experimental children were superior to the younger siblings of the control children on the Stanford-Binet.

There seem to be several variables which may affect findings pertaining to the benefits of early intervention. One of these is the sex of the child. Abelson reports that at the end of kindergarten Head Start boys demonstrated significantly greater skills than boys who had not attended Head Start. Head Start boys then exhibited significantly better performance in reading than non-Head Start boys at the end of first grade. She suggests that the Head Start experience, by enhancing the learning responsivity of boys, may make more of a difference over the long run for inner city boys than girls. Indeed, non-Head Start girls had caught up to their Head Start girl classmates by the end of first grade. Contrary to this however, is Beller's finding that early educational intervention, when measured in terms of academic achievement, appeared to show prolonged and consistent effects for disadvantaged girls; the findings for boys, are less marked and less consistent. In addition, Weikart reported that there are sex differences as a function of the type of instrument used in evaluation.

Whereas the boys generally scored higher than the girls on the PPVT, it was the girls' performance which was significantly higher on the California Achievement Test. Herzog suggests that the initial scores of the girls reflected their potential test and school performance more accurately than the initial scores of the boys reflected theirs. Whatever the reason—greater docility, cooperation or maturity—Herzog states that "this is a finding to be reckoned with in any comparisons of gains or before-and-after scores, especially when the subjects are very young children."

The relative socio-economic status of the child in his group may also be a variable which affects findings. Using a SES classification which combined the number of years of education of the child's mother with the person-to-room ratio, Herzog reports that the SES differences within the experimental group became more marked than those in the control group, suggestive that certain levels of socio-economic status within the poverty classification may be more easily strengthened by exposure to an enrichment program than other levels within the poverty classification.

Some of Sprigle's data suggest that the age at which intervention occurs might also affect reported impact. He suggests that children who began the Learning to Learn program at age four are performing at the end of first grade at the same level of reading ability as the children who began at five are performing at the end of second grade.

The type of preschool intervention and how it is related to the public school program also seems to affect impact. Not all preschool curricula are the same; moreover, as Karnes indicates, a preschool curriculum which focuses on specific learning tasks, language development and cognitive skills chosen from school related curricula, produces longer range benefits for subsequent school performance than does a less structured curriculum. As Abelson emphasizes, impact also differs according to the particular school situation the child enters. She reports that, in general, the Head Start graduates progressed more optimally in school programs which were geared to children's individual needs. "The fact that Head Start graduates in one of the Follow Through classrooms had advanced to grade-level in reading and arithmetic and age-level in verbal intellectual development by the end of first grade, illustrates the success which can be realized through educational efforts mounted on behalf of inner-city children."

Gray's report suggests that effective home training of the mother can act as a bridge to provide stability in transition from intervention to school setting. According to Gray, preschool programs cannot supply the whole burden of providing adequate schooling for disadvantaged children, but can provide a basis for future progress in schools and homes which can build on the preschool program. Similarly, Sprigle states that the school should provide for the active involvement of parents and encourage their commitment to the objectives of the program by means of parent education programs, and "homework" type activities.

What Conclusions Can We Draw?

To return to the question raised in the introduction: What do we know about the impact of any type of preschool intervention program? Review of the present chapters suggests preschool intervention cannot guarantee continued success throughout public school; it can definitely enhance school readiness and particular skills during the first few years of public school. It is important to note, however, that programs vary in emphasis, and this variance may determine what type of longer range benefit is observed. Although each program showed some positive gains, not all programs show positive effects in all forms of school performance.

In summary, the reports tend to suggest:

1) Preschool intervention programs have an immediate impact on the child's performance when measured by the Stanford-Binet, or personal-social adjustment ratings. Significance was reported in terms of IQ gains, measures of general cognitive and language skills, social adjustment and motivation.
2) On a long term basis, positive impact of intervention programs on school performance has been reported.
   a) In most cases, intervention children show continued significant IQ gains through the second grade. Loss in significance occurred in some cases because the control group increased in performance across grades.
   b) Intervention children perform significantly better than controls on achievement tests even after IQ differences were not found. Significant achievement results were most often reported in the area of reading ability.
   c) Intervention children were often rated as being better adjusted socially and showing more academic promise than control children.

3) There are certain variables which may affect the quality of impact:
   - a) age of the child
   - b) sex of the child
   - c) relative socio-economic status of the child within the poverty classification
   - d) initial IQ level of the child
   - e) particular instrument used to measure impact at a particular developmental age
   - f) type of preschool intervention curriculum
   - g) continuity of intervention across preschool and primary school grades.